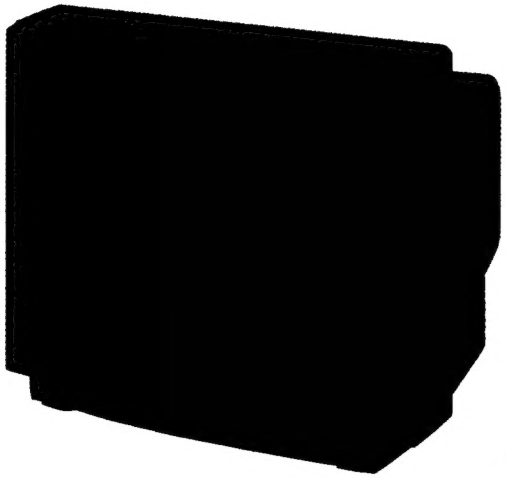
KV-X2133E
RM-689

SERVICE MANUAL

Spanish Model
Chassis No. SCC-D55A-A



AE-1B CHASSIS

Note: The service manual for RM-689 has been issued separately.

MODELS OF THE SAME SERIES	
KV-X2133E	
KV-X2533E	

SPECIFICATIONS

Television system B/G/H

Color system PAL, SECAM, NTSC3.58, NTSC4.33

Channel coverage VHF : E2-E12 UHF : E21-E69
CABLE : S01-S03, S1-S41

Picture tube Trinitron tube
Approx. 54.5 cm (21 inches)
(Approx. 51 cm picture measured diagonally
110-degree deflection

Inputs
- 1 21-pin connector : CENELEC standard including RGB input.
- 2 21-pin connector : including S video input
- 3 Video, Audio : phono jack.

Outputs
21-pin connector : CENELEC standard
Headphones jack : stereo minijack
External speaker terminals : 2-pin DIN
Audio output jacks : phono jack (output dependent upon TV settings)

Sound output 15 W + 15 W (music power)

Power consumption 90Wh

Dimensions Approx. 513x438x474 mm (w/h/d)

Weight Approx. 25.5 kg

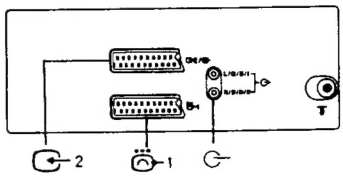
Supplied accessories RM-689 Remote Commander (1)
IEC designation R6 batteries (2)

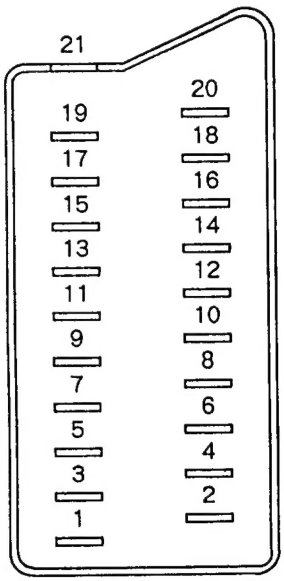
Design and specifications are subject to change without notice.

MICROFILM

TRINITRON® COLOR TV
SONY®

21 pin connector (1, 2)





Pin No	1	2	Signal	Signal level
1	O	O	Audio output B (right)	Standard level : 0.5Vrms Output impedance : Less than 1kohm *
2	O	O	Audio input B (right)	Standard level : 0.5Vrms Input impedance : More than 10kohms *
3	O	O	Audio output A (left)	Standard level : 0.5Vrms Output impedance : Less than 1kohm *
4	O	O	Ground (audio)	
5	O	O	Ground (blue)	
6	O	O	Audio input A (left)	Standard level : 0.5Vrms Input impedance : More than 10kohms *
7	O	●	Blue input	0.7V±3dB, 75ohms, positive
8	O	O	Function select (AV control)	High state (9.5–12 V) : Part mode Low state (0–2 V) : TV mode Input impedance : More than 10kohms Input capacitance : Less than 2 nF
9	O	O	Ground (green)	
10	O	O	Open	
11	O	●	Green	Green signal : 0.7V±3dB, 75ohms, positve
12	O	O	Open	
13	O	O	Ground (red)	
14	O	O	Ground (blanking)	
15	O	–	Red input	0.7V±3dB, 75ohms, positive
	–	O	(S signal) croma input	0.3V±3dB, 75ohms, positive
16	O	●	Blanking input (Ys signal)	High state (1–3 V) Low state (0–0.4 V) Input impedance : 75ohmes
17	O	O	Ground (video output)	
18	O	O	Ground (video input)	
19	O	O	Video output	1V±3dB, 75ohms, positive Sync : 0.3V (–3, +10dB)
20	O	–	Video input	1 V±3dB, 75ohms, positive Sync : 0.3V (–3, +10dB)
	–	O	Video Input/Y (S signal)	1 V±3dB, 75ohms, positive Sync : 0.3V (–3, +10dB)
21	O	O	Common ground (plug, shield)	

O connected ● unconnected (open) * at 20 Hz–20 kHz

WARNING !!

AN ISOLATION TRANSFORMER SHOULD BE USED DURING ANY SERVICE TO AVOID POSSIBLE SHOCK HAZARD, BECAUSE OF LIVE CHASSIS.
THE CHASSIS OF THIS RECEIVER IS DIRECTLY CONNECTED TO THE AC POWER LINE.

SAFETY-RELATED COMPONENT WARNING !!

COMPONENTS IDENTIFIED BY SHADING AND MARK ⚠ ON THE SCHEMATIC DIAGRAMS, EXPLODED VIEWS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

TABLE OF CONTENTS

NICAM Reception

Reception of NICAM broadcast is possible if the NICAM adaptor (available at your Sony dealer) is installed in the TV.

When the NICAM broadcast is being received, indicators illuminate according to the sound being heard.
Select the sound you want to hear by pressing the A/B bilingual button. Each time the A/B bilingual button is pressed, the sound will change as indicated with arrows in the following chart.

○ means that the indicator lights up.
× means that the indicator dose not light up.

The NICAM sound being broadcast	The sound you hear (Select with the A/B bilingual button.)	Indicators A	Indicators B	Indicators ⚮ * (NICAM)
Stereo	Stereo ← ↓ Regular ←	○	○	○
		×	×	○
A+B (Bilingual)	A ← ↓ B ↓ Regular ←	○	×	○
		×	○	○
		×	×	○
A	A ← ↓ Regular ←	○	×	○
		×	×	○
Regular only	Regular	×	×	×

* When the NICAM adaptor is installed, the ⚮ space sound indicator will function as the NICAM indicator (the space sound function will not be affected). When the NICAM broadcast is being received, the NICAM indicator lights up even when the regular sound has been selected.

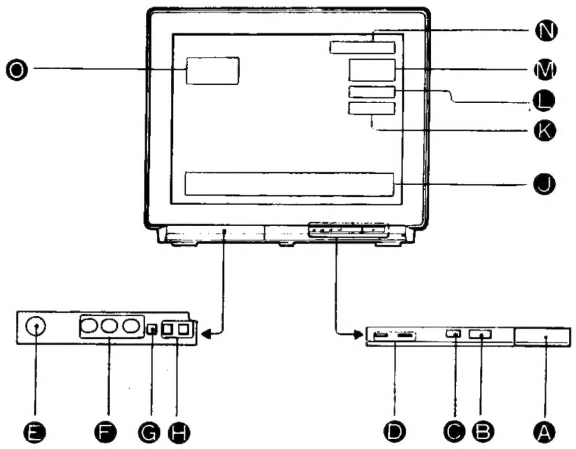
When you turn on the TV, what sound will be heard?
When the Regular sound and the NICAM sound are the same, the NICAM sound will be heard.
When the Regular sound and the NICAM sound are different, the Regular sound will be heard.

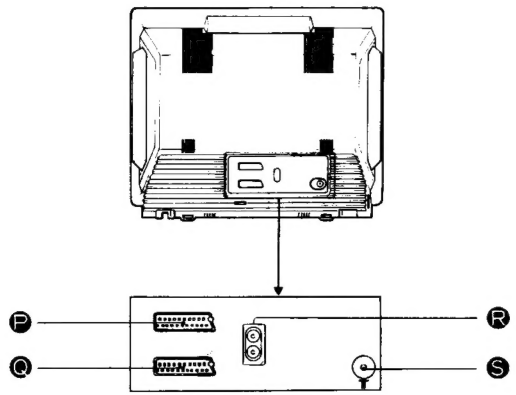
Note

The West German stereo programs can be received as explained in the supplied Operating Instructions.

SECTION 1
GENERAL

1-1. FUNCTION OF CONTROLS





ON THE SET

(A) Power Switch ⏻
Use it to switch the set on and off. When you switch the set on, the programme number of the station tuned in will be indicated in the on-screen display (M) for some seconds. In case of short breaks of operation, you can switch the set on and off using the Remote Commander (See »CONTROLS ON THE REMOTE COMMANDER«).

(B) Remote control detector
(See »CONTROLS ON THE REMOTE COMMANDER«).

(C) ⏻ Standby/Reponse indicator
This indicator lights up when the TV set is in standby mode and it flashes each time the set receives signals from the Remote Commander.

(D) Stereo A/B indicators ⓭
During bilingual programmes one of the two indicators lights up, depending upon the selected channel **A** or **B**. When stereo programmes are broadcast both indicators light up. (See »CONTROLS ON THE REMOTE COMMANDER«).

Jacks and control panel (front of set)
The jacks and the control panel are situated behind a cover. Please press the arrow marking on the cover to open it.

(E) ∩ Headphones jack (stereo minijack)
Connect only stereo headphones.

(F) ⊖ Input jacks
Video input jack (phono jack) ⊖3 (yellow)
Audio input jacks (phono jacks) ⊖ (red and white).

(G) Mode select button
Use this button to select either the channel select mode, volume adjustment ◿ or the ⊖ input mode.

(H) Adjustment buttons +/–
Select at first the item to be adjusted using the Mode select button (G) (**P**: channel select mode), ◿ (volume) or ⊖ (input mode), then adjust the item by pressing the + or – button.
You can also use these buttons to reset the picture and sound adjustments to the factory-set levels. For this purpose press both buttons simultaneously.

On-screen display
When you repeatedly press button ⓭ 12 on the Remote Commander, the following information will be indicated on the screen in turn:

(J) Picture and sound adjustment items:
◑ contrast, ◕ colour, ☼ brightness, 𝄢 bass, 𝄞 treble or ◺ balance and their respective levels; as well as 🔇 mute, →•← reset, ⓭ space sound, ∿ loudness and NICAM indications, when the respective buttons are pressed.

When you press button ⊖ 10 on the Remote Commander, the following information will be indicated on the screen:

(K) TV-System: I (normal UK broadcast system)

(L) Channel number

(M) Programme number or input mode;
⊖1, 📷, ⊖2, ⓭2, ⊖3;

(N) Indication of the station name

(O) AV output indication; 1 ⊖, 2 ⊖, 3 ⊖ or **TV** ⊖ (see »CONTROLS ON THE REMOTE COMMANDER«).

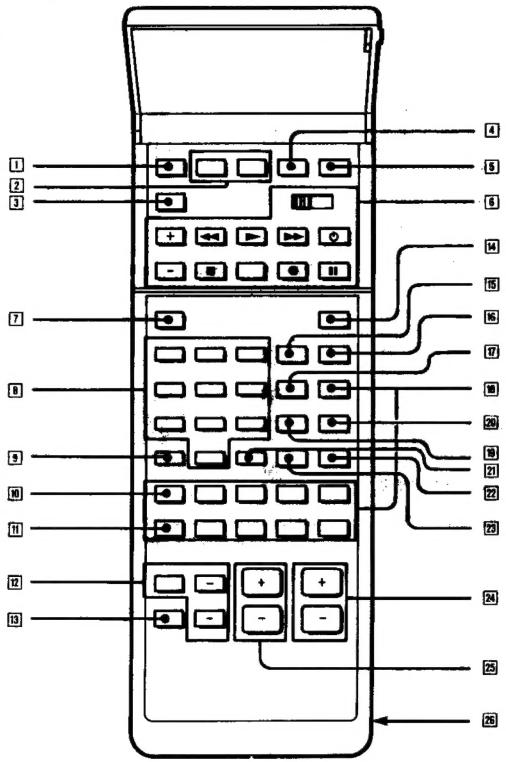
Connectors on the rear

(P) Euro-AV-connector 21-pin ⊖2/⓭2
For connecting a VTR, 8 mm video camera recorder, a video disc player or in general devices with an S-Video-output.

(Q) Euro-AV-connector 21-pin 📷1
For connecting a VTR, a computer etc. with RGB output.

(R) Audio-output-jacks (phono jacks) ⊖
For connecting audio equipment, e.g. an amplifier, so that the sound will be output at the audio equipment. In this case the volume is adjustable on the TV set.

(S) Aerial terminal ⊤



ON THE REMOTE COMMANDER

On the set there is a Remote Control detector Ⓑ, which receives the signals of the Remote Commander.

[1] **Preset-button** Used for selecting the Preset mode. See »TO PRESET CHANNELS«.

[2] **Tuning +/– buttons**
a) Preset mode: Used for tuning in stations in the Automatic Station Search: See »TO PRESET CHANNELS«.
b) TV-mode: Used for fine-tuning a station. See »ADDITIONAL FUNCTIONS«.

[3] **C button (Clear)**
Used for clearing programme positions, so that the position will be skipped when the PROGR +/– buttons [24] are pressed. See »TO PRESET CHANNELS«.

[4] **◇ Store button:** Used for storing channels. See »TO PRESET CHANNELS«.

[5] **TV-system-select-button**
This button has no function.

[6] **Video selector and video operation buttons**
Used for operating Sony video equipment. For details see »OPERATING OTHER EQUIPMENT«.

[7] **Mute button**
By pressing this button the sound of the set will be switched off and by pressing it once more the sound will be restored.

[8] **Number buttons**
a) Used to select programme positions or to input channel numbers (in the preset mode).
b) If the set is in the standby mode, press one of the number buttons to switch it on.
c) After pressing the output select button the buttons 1–2 can be used to select the different output connectors.

[9] **-/-- Button**
In case of two digit numbers, press first this button and then the two respective number buttons [8].

[10] **Button for On-screen display**
By pressing this button, information about the station tuned-in will be indicated on the screen. The indications will disappear after some seconds with the exception of the programme number and label, which will stay on the screen until the button is pressed once again.

[11] **Time button**
In TV-mode: If teletext service is broadcast on the selected channel, press this button to display the current time on the screen and once again to make it disappear.

[12] **+/– Buttons for picture and sound adjustments**
a) TV-mode:
The picture and sound adjustments are stored as standard values. You have, however, the possibility to change them to your individual liking. Press the button repeatedly until the required item is indicated in the on-screen display: ◑ contrast, ◕ colour, ☼ brightness, hue (only for NTSC colour system), bass, treble or balance. You can adjust the settings by pressing the + or – button.
b) Preset-mode: Use these buttons to name a station. See »TO PRESET CHANNELS«.

[13] **→●← Reset-button**
By pressing this button the picture and sound adjustments are reset to the factory-set levels.

[14] **Standby-button**
Press this button to switch the set into standby-mode. You can switch it on again by pressing the TV-button [16] or one of the number buttons [8]. To return to the teletext mode, press [18] button. There will be a slight delay before the picture is restored.

Note

Use the Standby-button [14] only when switching the set off for a short period of time. If the set will not be used for a longer span of time, switch it off by using the Power switch Ⓐ.

[15] **Input-Select-Button**
Press this button to select the audio- or video-signals input at the various input connectors. With each pressing of the button a different connector is selected. The following indications will appear sequentially:
1 → (RGB) → 2 → 2 → 3
TV Mode

[16] **TV-Button**
When pressing this button the set returns from standby, video input- or teletext mode to the TV-mode.

[17] **Output-Select-Button**
Press this button to select the audio- or video signals to be output at the / connector.
With each pressing of the button a different output source will be selected. The following indications appear sequentially:
1, 2, 3, TV

[18] **Teletext operation buttons**
These buttons are used for teletext operation. See »VIEWING TELETEXT«.

[19] **Loudness button**
By pressing this button the high and low tones will be emphasized. Press the button again to restore the normal sound. The indications on the screen will be (ON) or (OFF).

[20] **A/B button**
To select the audio channel of bilingual programmes. Usually the dubbed version is broadcast on channel **A** and the original sound is broadcast on channel **B**.
In the video input mode (Euro-AV-connectors) this possibility of selecting channels also exists for stereo VTR connection.

[21] **C (Channel select) button**
Use this button for direct channel tuning in the TV-mode. See »ADDITIONAL FUNCTIONS«.

[22] **This button has no function on this set.**

[23] **Space sound button**
Press this button to obtain special acoustic effects. Press it again to restore the normal sound. The indications on the screen will be (on) or (off).

[24] **PROGR +/– buttons**
TV-mode: Use these buttons to scan the available programmes up- or downwards.
Preset mode: Use these buttons to scan the available channels up or downwards.

[25] **+/– buttons for adjusting the volume**

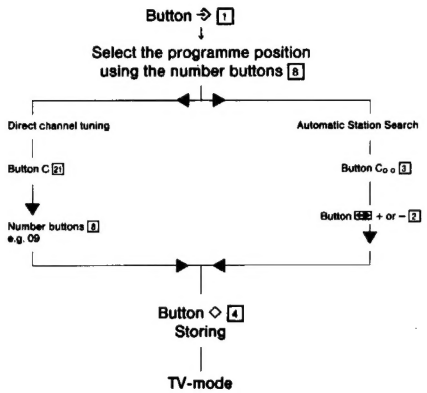
[26] **Battery compartment (on the rear)**

1-2. TO PRESET CHANNELS

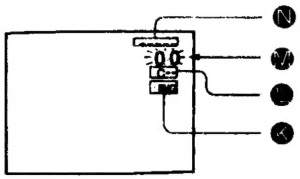
Use the buttons on the Remote Commander for presetting. In total there are 60 programme positions at your disposal for storing channels.
There are two different ways of tuning in channels:

1. Direct Channel Tuning
If you know the channel number of a station you can input it directly.

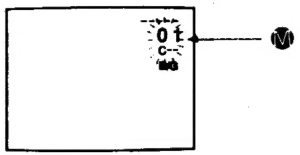
2. Automatic Station Search
The set searches automatically for stations.



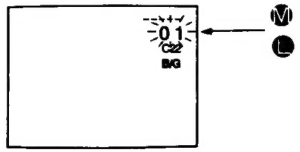
1. Direct Channel Tuning
1. Press the Preset button ◇ 1. You are now in the preset mode of the set. The programme number in the on-screen display (M) starts blinking.



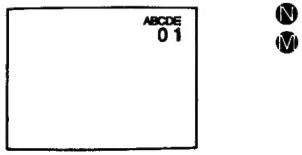
2. With the buttons PROGR +/– 24 or the number buttons 8 you can select the programme position. In case of two-digit numbers, press first the button -/-- 9 and then the two number buttons.



3. Press button C 21. The indication »C« and the channel number start blinking in the display (L). Select the channel number with two digits (e.g. 22) using the number buttons 8



4. Press the button ◇ 4 in order to store the channel and to return to the TV-mode.



If you want to store further channels, repeat the steps 1 to 4.

2. Automatic Station Search

1. Press button ◇ 1. You are now in the preset mode of the set. The programme number in the on-screen display (M) starts blinking.

2. With the PROGR buttons +/– 24 or the number buttons 8 you can select the programme position. In case of two-digit numbers, first press button -/-- 9 and then the two number buttons.

3. If there is already a stored station on the selected programme position, press button C 3.

4. Press one of the tuning buttons +/– 2 to start the station search. The search will be interrupted as soon as a station is tuned in. Press the tuning buttons repeatedly until you find the desired station.

5. If you have found the desired station, press button ◇ 4. Now the selected station is stored and you are back in the TV-mode.

6. If you want to store further stations, repeat the steps 1-5.

Skipping of unused programme positions
Using button C○○ 3 you have the possibility to skip unused programme positions (e.g. without a stored station), when pressing the buttons PROGR +/– 24 on the Remote Commander.

1. Press button ◇ 1. You are now in the preset mode of the set.

2. Use the buttons PROGR +/– 24 to select a programme position, which you want to have skipped.

3. Press button C○○ 3.

4. Press button ◇ 4 to store the cleared programme position and to return to the TV-mode.

The skipped programme position still appears when you press the number buttons 8 on the Remote commander.

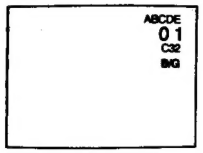
If you want to name a station
After presetting the stations you have the possibility to name them. The selected name will appear in the on-screen display (N).

1. Press the preset button ◇ 1.

2. Press the button 12. The first column of the station name starts blinking. Press either button + or – 12 and select the desired character (number or letter, 0-9, A-Z, or – for a blank space).

3. Press button 12 again. Now the second column starts blinking and you can select the second character.
In this way five characters can be selected.

4. Press button ◇ 4 to store the station name.



Notes

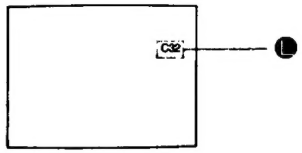
- If you press the preset button ◇ 1 instead of button ◇ 4 the set will return to the TV-mode without storing the channels.
- If you press a wrong programme or a channel number, an »x« will be displayed on the screen.
- When pressing two number buttons, the second number button should be pressed within 5 seconds after the first one, otherwise the operation will be cancelled.

ADDITIONAL FUNCTIONS

Direct Channel Tuning in the TV-mode
You have the possibility to tune in channels directly when the set is in the TV-mode without storing these channels.
Example: If you tune in channel number 32 and then switch the set off or change the programme position, this channel will be cancelled.

1. Press the button C 21. In the display (L) the indication »C« will appear.

2. Select the channel number with two digits using the number buttons 8 (e.g. for channel 4 press first 0, then 4). The indication on the screen will disappear within some seconds.



Manual Fine Tuning
If the reception of a channel is not satisfactory, you have the possibility to deactivate the Automatic Fine Tuning, which is usually in operation during presetting in order to tune in the best possible picture.
Press one of the tuning buttons +/– 2 to fine-tune a channel. The Automatic Fine Tuning will be restored when the respective programme position is pressed once again.

The set is capable of receiving NICAM, which is a newly developed digital stereo broadcast system.
NICAM programmes are broadcast in three ways: stereo, bilingual or monoaural sound besides the regular (FM mono) sound, and you can select the sound you want to hear by pressing the A/B button [20].
Each time the button is pressed, the sound changes sequentially, as indicated with arrows in the following chart.

NICAM sound being broadcast	The sound you hear (Select with the A/B button [20].)
Stereo	Stereo → Regular → Stereo (etc.)
Bilingual	A → B → Regular → A (etc.)
Monoaural	A → Regular → A (etc.)

Whenever a NICAM broadcast is received, the ⋈ indication appears on the screen and disappears after a few seconds.

When the NICAM programme ends, the ⋈ indication appears for a few seconds.

The sound being broadcast	The selected sound	CD indicators A	CD indicators B	NICAM indication on the screen
NICAM + Regular	Stereo	x	x	x
	A	x	o	
	B	o	x	
	Regular	o	o	
Regular	Regular	o	o	o

x means that the indicator ● lights up or the indication appears.

o means that the indicator does not light up or the indication is not displayed.

1-3. VIEWING TELETEXT

To view the teletext service, use the Remote Commander.
The buttons for teletext operation are indicated in green.

Operation

1 Select the TV channel for the desired teletext service. If the signal is weak, teletext errors often occur.
2 Press ▣/◩ (TEXT/MIX) to display the teletext service.
3 Key in the three digits of the desired page using the number buttons. If an error is made, complete the three-digit sequence by keying in any digit. Then, re-enter the correct page number.

The requested teletext page is displayed.

To return to the TV mode, press TV [16] on the Remote Commander.

The teletext service can be displayed directly from the standby mode by pressing ▣/◩ (TEXT/MIX).

To receive the teletext service of a different TV channel
1 Press TV [16] to return to the TV mode.
2 Select the desired TV channel.
3 Press ▣/◩ (TEXT/MIX).

Note

Buttons not referred to in the text do not operate.

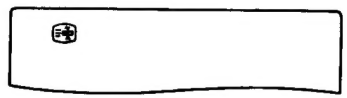
To request the index page
Press ◧ (INDEX).
If the necessary signal is not being broadcast, page 100 is displayed.

To access the next or preceding page
Press ⊞ (PAGE +) or ⊟ (PAGE –).

To superimpose the teletext display on the picture (MIX)
Press ▣/◩ twice from the TV mode.
Press ▣/◩ again to return to the TEXT display.

To suppress the teletext display so that the picture is restored
Press ⊠ (text clear). This button can be operated from both the text and mix displays.

To prevent a teletext page from being updated/changed
Press ⊡ (HOLD). The HOLD symbol appears on the screen.
To resume normal teletext reception, press ▣/◩ (TEXT/MIX).

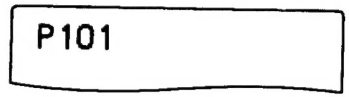


To resume normal teletext reception, press ▣/◩.

To enlarge the teletext display
Press ⊞ once to enlarge the upper half of the display; press again to enlarge the lower half of the display. And press again to return to the normal display.

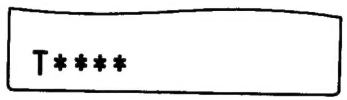
To reveal concealed information such as answers to a quiz
Press ◨ (REVEAL).
Press again to conceal the answers.

To watch the TV programme while waiting for a requested page to be displayed
1 Request the new page.
2 Press ⊠ to watch the TV programme.
The requested page number and other data appear at the top of the screen. When the requested page has been captured, the page number is displayed in the top left hand corner of the screen.

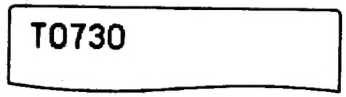


To view this page, press ▣/◩.

To have a requested page displayed at a pre-determined time
1 Request a time coded page (e.g. alarm page).
2 Press ⊡ (TP ON).
"T****" will appear at the bottom of the screen.



3 Enter your request time with the number buttons, using four digits. For example, 07.30:



To watch the TV programme until the requested time, press ⊠ (TEXT CL). At the requested time, the page number will be displayed at the bottom of the screen.
To view this page, press ▣/◩.
To cancel the request, first ensure that the teletext page is displayed, then press ⊡ (TP OFF).

FASTEXT Operation

FASTEXT Teletext enables you to access pages quickly and conveniently with one key operation.

When a FASTEXT page is broadcast a colour coded menu will appear at the bottom of the screen. Each coloured prompt relates to the coloured keys on the Remote Commander. Pressing one of these will select the page described by the prompt.

Selection may also be made by entering the three digit page number in the normal way.

Correct FASTEXT operation relies on the necessary signals being transmitted by the Broadcasting Authorities. It is possible that some Broadcasters will not support this transmission.

If FASTEXT is not transmitted, the decoder will operate as outlined above.

1-4. OPERATING OTHER EQUIPMENT

To view the input picture
Press the ⊖ 15 button repeatedly until the desired input signal indication appears on the screen.

⊖ **1:** to view the audio and video signal input through the ⊖1 connector on the rear.

⊖1: to view the RGB signal (i.e. from a computer, etc.) input through the ⊖1 connector.

⊖ **2:** to view the audio and video signal input through the ⊖2/⊖ connector on the rear.

⊖ **2:** to view the S video signal (from a VTR equipped with an S video output) input through the ⊖2/⊖ connector.

⊖ **3:** to view the audio and video signal input through the ⊖3 connectors and the audio input jacks ⊖ (yellow, white and red) on the front.

You can also select the desired input mode using the buttons on the front of the set. Select the ⊖ mode with the mode select (P → ◿ → ⊖) button ⓒ then press +/– button.

To return to the TV mode, press the TV-button 16.

To select the signal to be output from the ⊖2/⊖ connector
Press the ⊖ button 17 repeatedly until the desired output source is indicated on the screen:

1 ⊖: The audio and video signal input through the ⊖1 connectors is output from the ⊖2/⊖ connector.

2 ⊖: The audio and video signal input through the ⊖2/⊖ connector is output from the ⊖2/⊖ connector.

3 ⊖: The audio and video signal input through the ⊖3 connectors is output from the ⊖2/⊖ connector.

TV ⊖: The audio and video signal input through the ⊤ aerial terminal (i.e. usually the TV signal) is output from the ⊖2/⊖ connector.

The indication will disappear after a few seconds.

Note

The TV-signal is always output at the EURO-AV connector ⊖1.

To operate Sony video equipment
The video operation buttons 6 on the Remote Commander can operate certain VTRs and video disc players manufactured by Sony.

1. Switch the video selector to the desired position.
VIDEO 1: to operate Sony Betamax VTR and SLV 202 VHS.
VIDEO 2: to operate Sony 8 mm VTR.
VIDEO 3: to operate Sony VHS VTR.
MDP: to operate Sony video disc player including a multi disc player.

2. Press the operation button(s) to start operation.
PROGR +/–: to select the desired programme on the VTR.

▶ : to start playback, or to release the pause mode

■ : to stop the tape or the disc

◀◀ : to rewind the tape from stop mode or to rapidly go back to the desired position on the disc or tape from playback mode

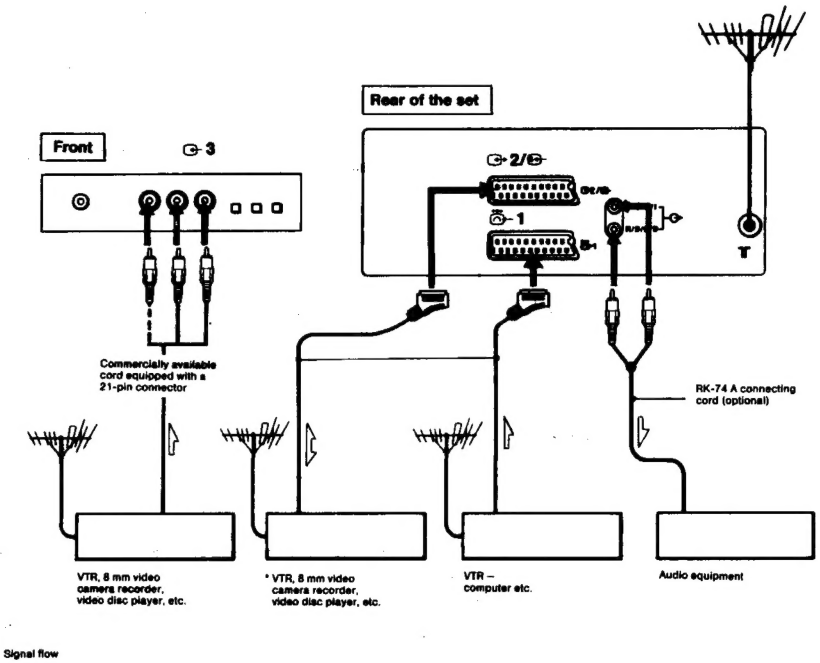
▶▶ : to fast forward wind from stop mode or rapidly advance the tape or disc to the desired position from playback mode

● : to start recording on the VTR
Be sure to press this button and the one on the right simultaneously

⏻ : to switch the video equipment on and off

■■ : to stop the tape or the disc temporarily (pause)
Press again to release pause mode

1-5. CONNECTING OTHER EQUIPMENT



* Connect the S video output of the VTR, etc. here.

Notes

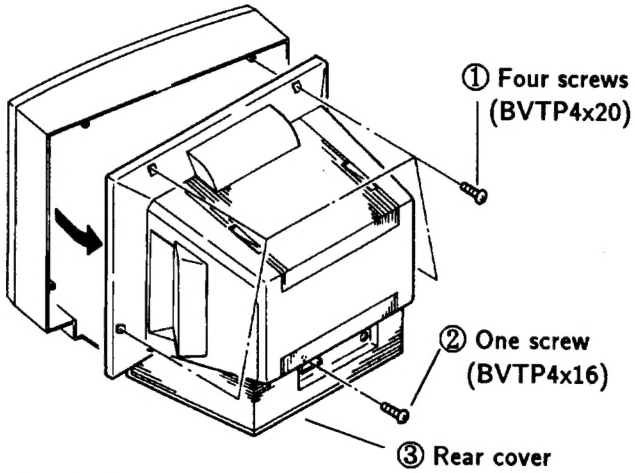
- It is also possible to connect a VTR using the ⊤ terminal. In this case, connect the aerial to the aerial terminal of the VTR.
- Move the VTR away from the TV if the picture or the sound is distorted.
- Computers which have RGB output only can be connected to the ⊖1 input connector.

S video input (Y/C input) ⊖
Video signals may be separated into Y (luminance or brightness) and C (chrominance) signals.
Usually these two signals are combined in a VTR and output as one signal, and supplied to a TV. Separation of the Y and C signals prevents them from interfering with one another, thereby improving picture quality (especially in luminance). This set is equipped with a S video input through which these separated signals can be input directly.
Connect the S video output jack on the VTR to the S video input on this set.

Note: Not all VTR's are equipped with S video output capability. (Refer to VTR operating manual.)

SECTION 2
DISASSEMBLY

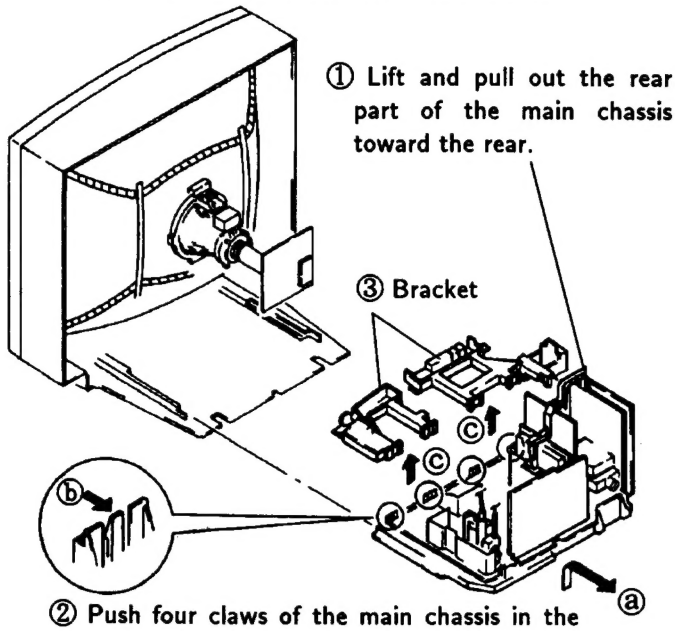
2-1. REAR COVER REMOVAL



① Pull the rear cover and turn the right the speaker leads a fixed by the pathlock on the chassis.

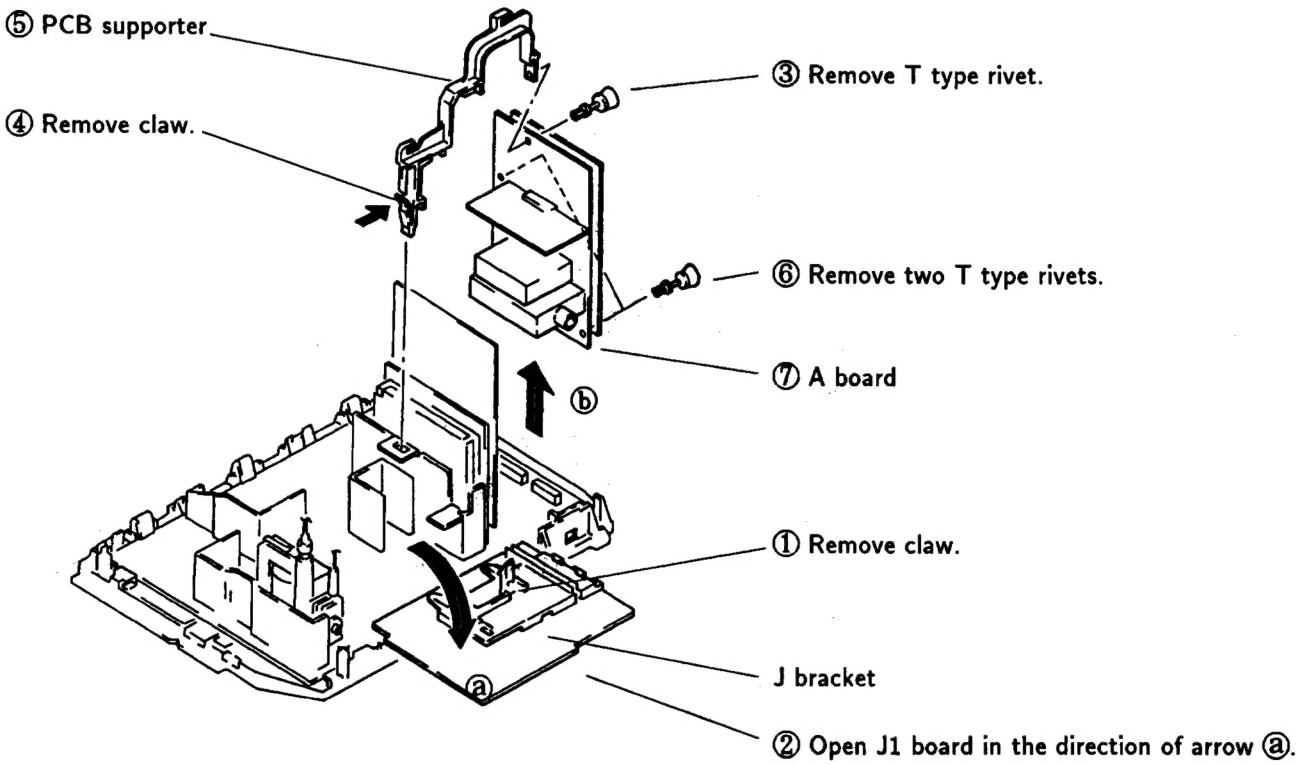
② When attacing the rear cover for the speaker leads by pathlock.

2-2. CHASSIS ASSEMBLY REMOVAL

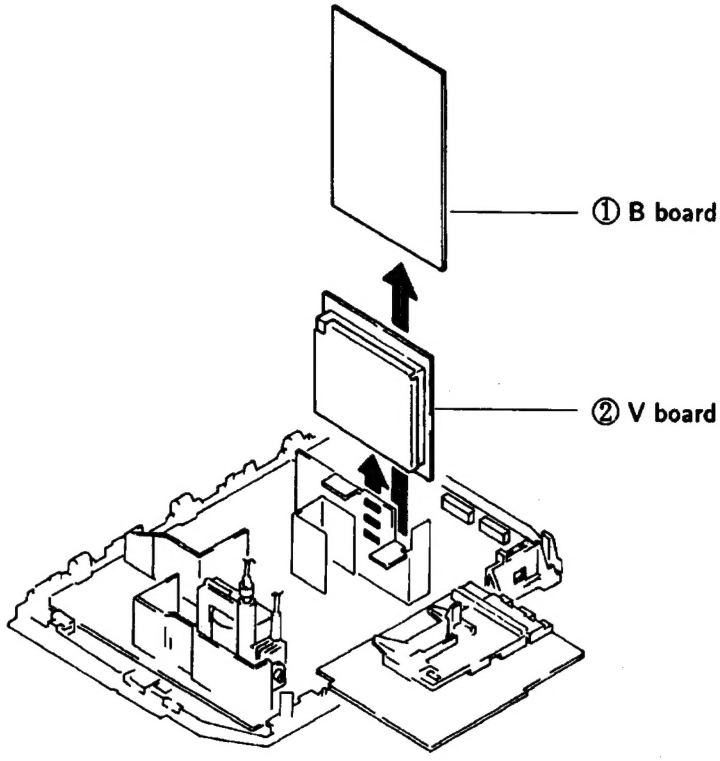


② Push four claws of the main chassis in the direction of arrow and remove the bracket.

2-3. A AND J1 BOARDS REMOVAL

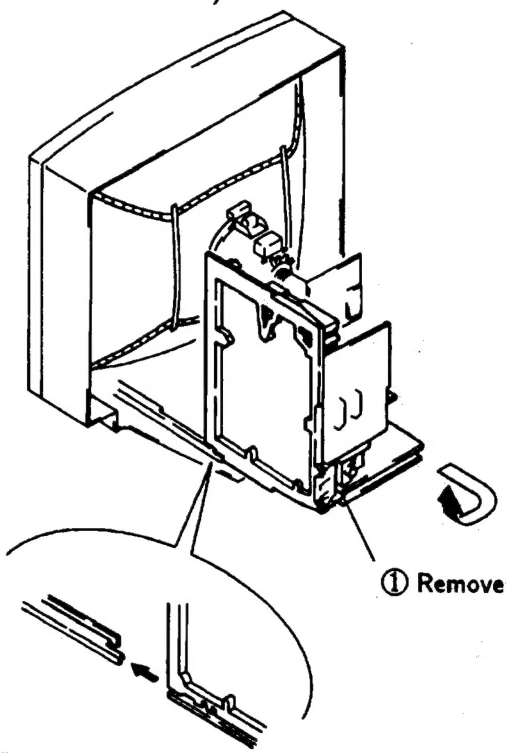


2-4. B AND V BOARDS REMOVAL



2-5. SERVICE POSITION

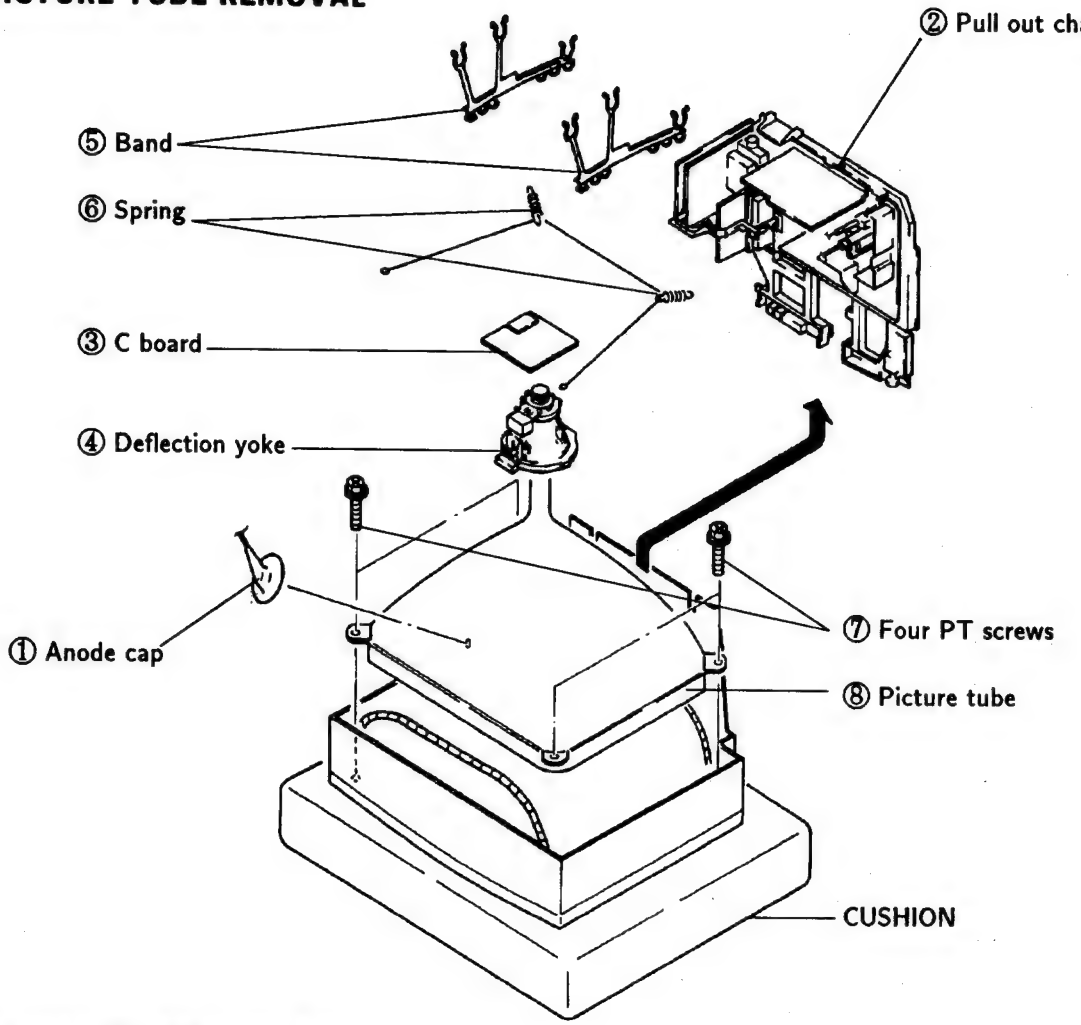
* Remove the connector bracket and then perform the following servicing.
(Refer to 2-2. CHASSIS ASSEMBLY REMOVAL.)



① Remove main chassis in the arrow direction.

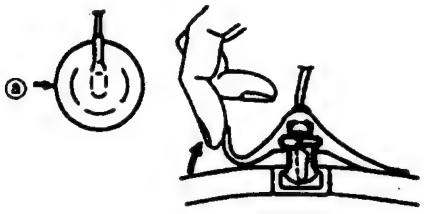
② Install the main chassis on to the holder.

2-6. PICTURE TUBE REMOVAL

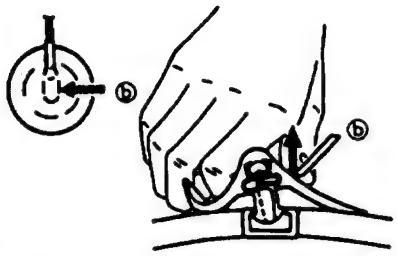


• REMOVAL OF ANODE-CAP

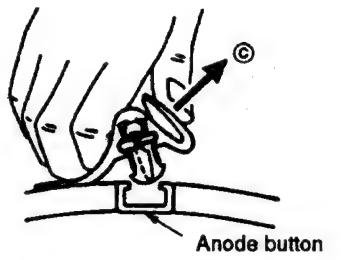
• REMOVING PROCEDURES



① Turn up one side of the rubber cap in the direction indicated by the arrow ⓐ.



② Using a thumb pull up the rubber cap firmly in the direction indicated by the arrow ⓑ.



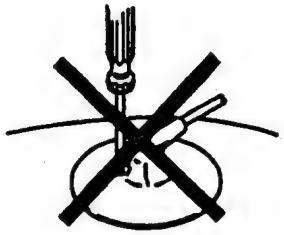
③ When one side of the rubber cap is separated from the anode button, the snode-cap can be removed by turning up the rubber cap and pulling up it in the direction of the arrow ⓒ.

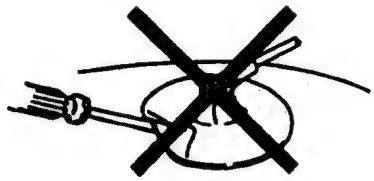
• HOW TO HANDLE AN ANODE-CAP

① Don't hurt the surface of anode-caps with sharp shaped material!

② Don't press the rubber hardly not to hurt inside of anode-caps!
A material fitting called as shatter-hook terminal is built in the rubber.

③ Don't turn the foot of rubber over hardly!
The shatter-hook terminal will stick out or hurt the rubber.





SECTION 3
SET-UP ADJUSTMENTS

- When complete readjustment is necessary or a new picture tube is installed, carry out the following adjustments.
- Unless there is specific instruction to the contrary, carry out these adjustments with the rated power supply.
- Unless there is specific instruction to the contrary, set the controls and switches this way :
  - ◑ Contrast ·····80%
    (or remote control normal)
  - ☼ Brightness ·····50%
- Carry out the following adjustments in this order:
  1. Beam landing
  2. Convergence
  3. Focus
  4. White balance

Note : Testing equipment required
1. Color bar/pattern generator
2. Degausser
3. DC power supply
4. Digital multimeter
5. Oscilloscope

Preparations :
- In order to reduce the influence of geomagnetism on the set's picture tube face it east or west.
- Switch on the set's power and degauss with the degausser.

3-1. BEAM LANDING

1. Input the white signal with the pattern generator.
   Contrast, Bightness } normal
2. Set the pattern generator raster signal to red.
3. Move the deflection yoke to the rear and adjust with the purity control so that the red is at the center and the blue and the green take up equally sized areas on each side.
   (See Figures 3-1 through 3-3.)
4. Move the deflection yoke forward and adjust so that entire screen is red. (See Figure 3-1.)
5. Switch the raster signal to blue, then to green and verify the condition.
6. When the position of the deflection yoke has been decided, fasten the deflection yoke with the screws.
7. If the beam does not land correctry in all the corners, use a magnet to adjust it.
   (See Figure 3-4.)

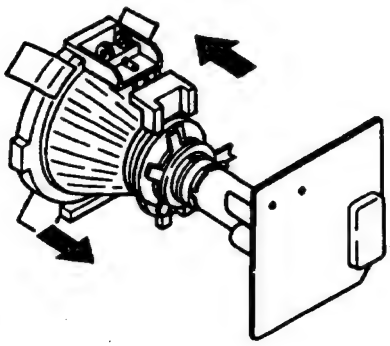


Fig. 3-1

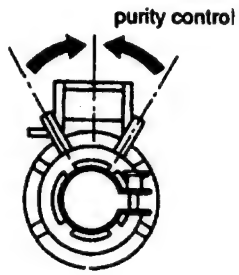


Fig. 3-2

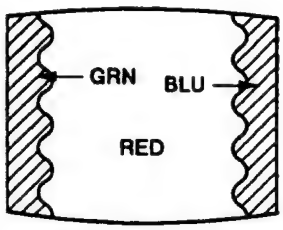


Fig. 3-3

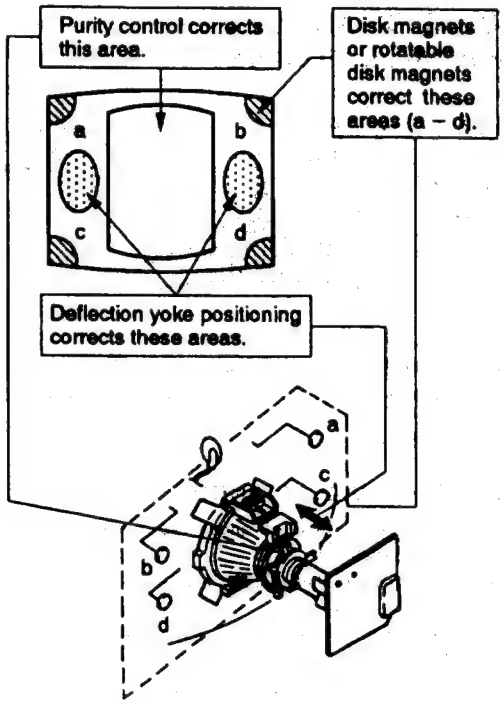


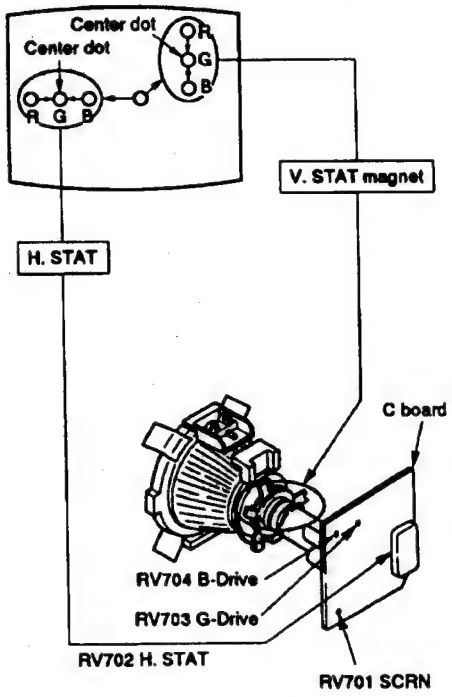
Fig. 3-4

3-2. CONVERGENCE

Preparations :

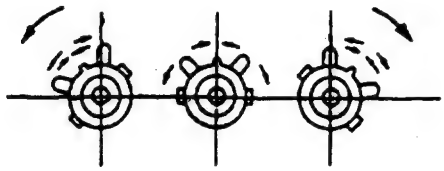
- Before starting this adjustment, adjust the focus, horizontal size, and vertical size.
- Minimize the brightness setting.
- Provide dot pattern.

(1) Horizontal and vertical static convergence

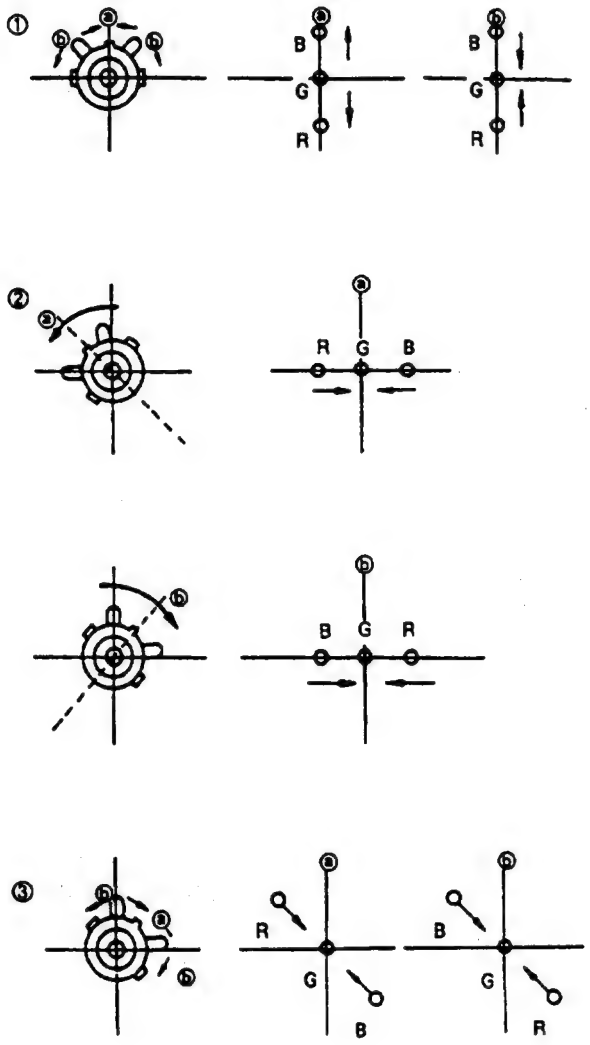


1. (Moving horizontally), adjust the H.STAT control so that the red, green, and blue points are on top of each other at the center of the screen.
2. (Moving vertically), adjust the V.STAT magnet so that the red, green, and blue points are on top of each other at the center of the screen.
3. If the H.STAT variable resistor can not bring the red, green, and blue points together at the center of the screen, adjust the horizontal convergence with the H.STAT variable resistor and the V. STAT magnet in the manner given below.
   (In this case, the H.STAT variable resistor and the V.STAT magnet influence each other's settings.)

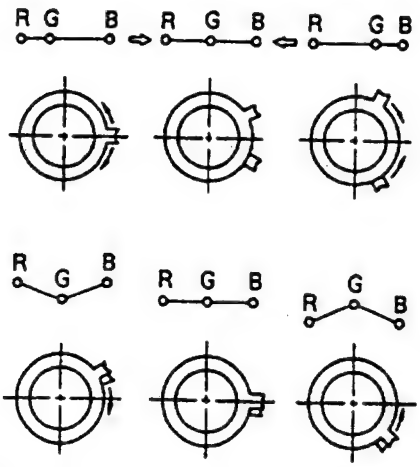
- Tilt the V.STAT magnet and adjust the static convergence by opening or closing the V.STAT magnet.

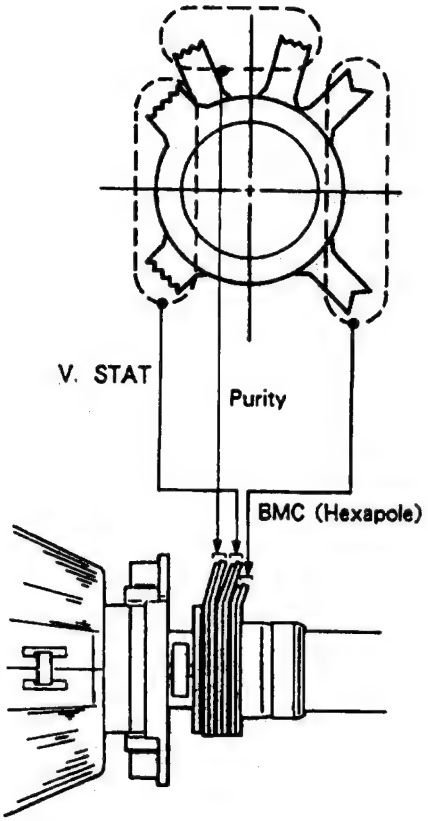


4. If the V.STAT magnet is moved in the direction of the ⓐ and ⓑ arrows, the red, green, and blue points move as shown below.



- Operation of BMC (Hexapole) Magnet





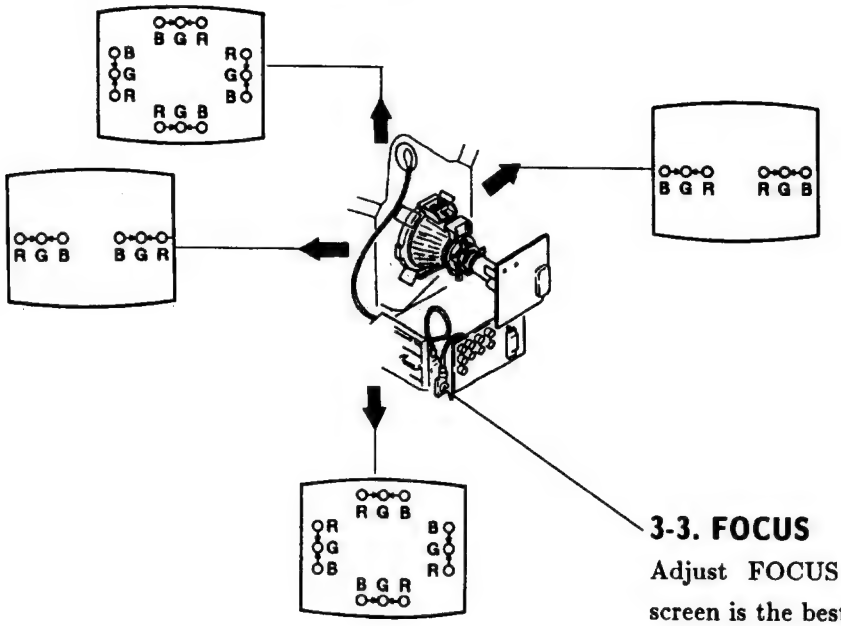
- The respective dot operations resulting from the operation of each magnet are not completely independent, so be sure to perform adjustment while tracking.
  Use the H.STAT VR to adjust the red, green, and blue dots so they coincide at the center of screen (by moving the dots in the horizontal direction).

(2) Dynamic convergence adjustment

Preparations :

Before starting this adjustment, adjust the horizontal static convergence and the vertical static convergence.

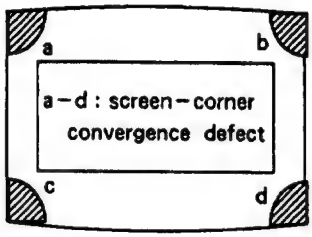
1. Slightly loosen the deflection yoke screws.
2. Remove the deflection yoke spacer.
3. Move the deflection yoke as shown in the figure below and optimize the convergence.
4. Tighten the deflection yoke screws.
5. Install the defelection yoke spacer.

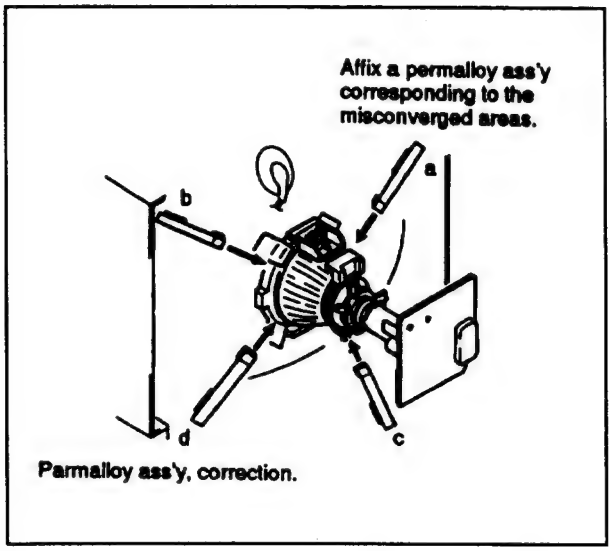


3-3. FOCUS

Adjust FOCUS so that the whole screen is the best focus.

(3) Screen corner convergence





3-4. WHITE BALANCE

[Screen G2 setting]

1. Input the dot signal from the pattern generator.
2. Set the picture brightness control to its lowest level.
3. Apply 170V DC to the R, G, and B cathodes with an external power supply.
4. While watching the picture, adjust G2 control RV701 (Screen) to the point just before the return lines disappear.

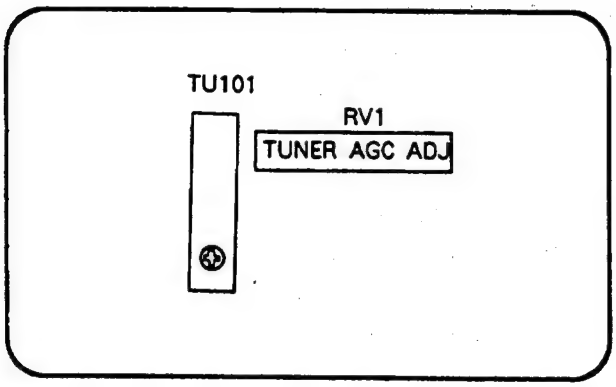
[White balance adjustment]

1. Input an all-white signal from the pattern generator.
2. Set the picture brightness and color controls to their normal levels.
3. Use the RV704 (B Drive) and RV703 (G Drive) to adjust white balance.

In the adjustments below, have the picture color and brightness settings at their normal levels unless there is a specific instruction to the contrary.

SECTION 4
CIRCUIT ADJUSTMENTS

4-1. A BOARD ADJUSTMENT

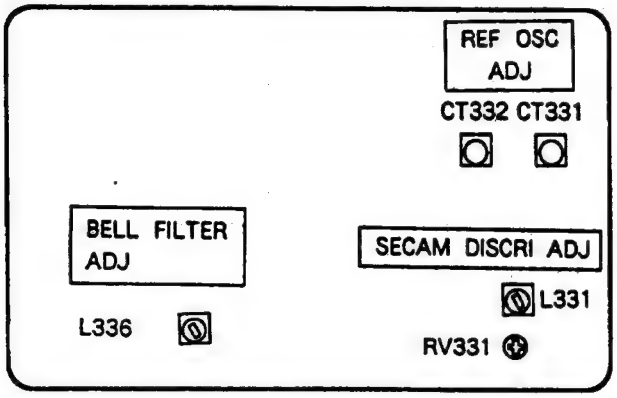


(COMPONENT SIDE)

TUNER AGC ADJUSTMENT (VIF101, RV1)

1. Align with an appropriate signal between stations.
2. Adjust RV1 so that snow noise and cross modulation just disappear from the picture.

4-2. B BOARD ADJUSTMENTS



(COMPONENT SIDE)

REFERENCE OSCILLATOR ADJUSTMENT (CT332 8.8MHz)

1. Input a PAL color bar signal.
2. Ground pin ⑰ of the IC331.
3. Adjust CT332 to obtain synchronization.

REFERENCE OSCILLATOR ADJUSTMENT (CT331 7.16MHz)

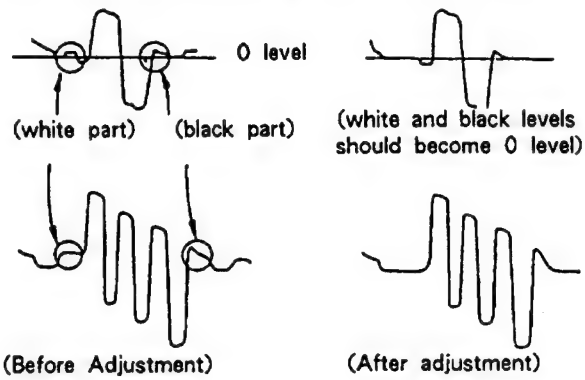
1. Input an NTSC color bar signal.
2. Ground pin ⑰ of IC331.
3. Adjust the CT331 to obtain synchronization.
4. Remove the jumper grounding pin ⑰ of IC331.

BELL FILTER ADJUSTMENT (L336)

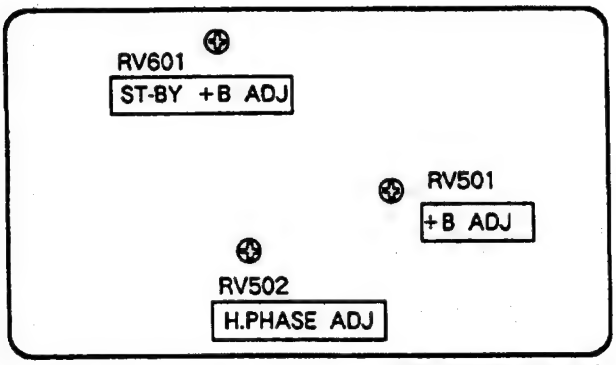
1. Input a SECAM color bar signal.
2. Connect the oscilloscope to the emitter of Q335.
3. Adjust L336 so that the waveform is flat.

DISCRIMINATION ADJUSTMENT (RV331 and L331)

1. Input a SECAM color bar signal.
2. Connect the oscilloscope to pin ① of IC331.
3. Adjust RV331 so that the white and black sections of the waveform at pin ① come to the 0 level.
4. Connect the oscilloscope to pin ③ of IC331.
5. Adjust L331 so that the white and black sections of the waveform at pin ③ come to the 0 level.



4-3. D BOARD ADJUSTMENTS



(COMPONENT SIDE)

+B ADJUSTMENT (RV501)

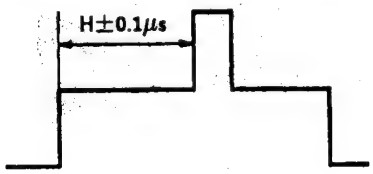
1. Connect the digital multimeter to TP91.
2. Adjust RV501 to obtain 135±0.2V.

ST-BY +B ADJUSTMENT (RV601)

1. Put the system into ⏻ standby mode (remote commander).
2. Connect the digital multimeter to TP91.
3. Adjust RV601 to obtain 135±3V.
4. Take the system out of ⏻ standby mode (remote commander).

H.PHASE ADJUSTMENT (RV502)

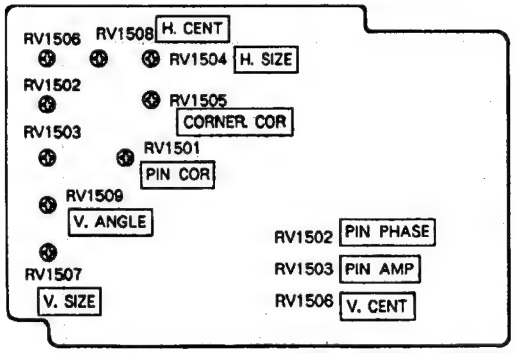
1. Input a PAL color bar signal.
2. Set the picture and brightness controls to their normal levels.
3. Set RV1508 (H.CENT) to its mechanical center.
4. Connect the oscilloscope to pin ⑪ (SCP) of IC 501.
5. Rotate RV502 to adjust to H±0.1μs.
   See below table for the H value.



Standard of H.Phase

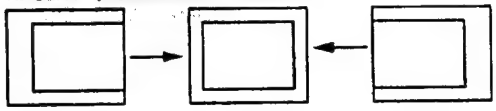
Model Size	H
21"	5.6μs
25"	5.1μs
29"	5.5μs

4-4. J1 BOARD ADJUSTMENTS

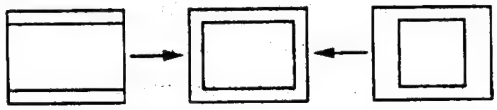


(COMPONENT SIDE)

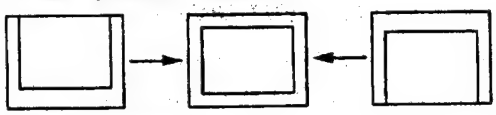
RV1508
H. CENT (HORIZONTAL CENTER)



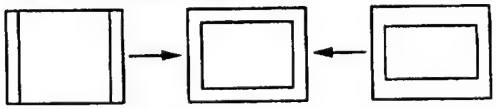
RV1504
H. SIZE (HORIZONTAL SIZE)



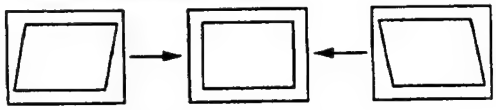
RV1506
V. CENT (VERTICAL CENTER)



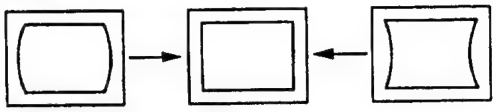
RV1507
V. SIZE (VERTICAL SIZE)



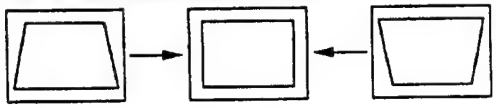
RV1509
V. ANGLE (VERTICAL ANGLE)



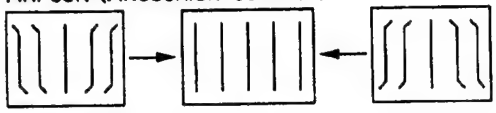
RV1503
PIN AMP (PINCUSHION AMPLIFIER)



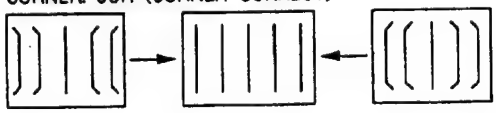
RV1502
PIN PHASE (PINCUSHION PHASE)



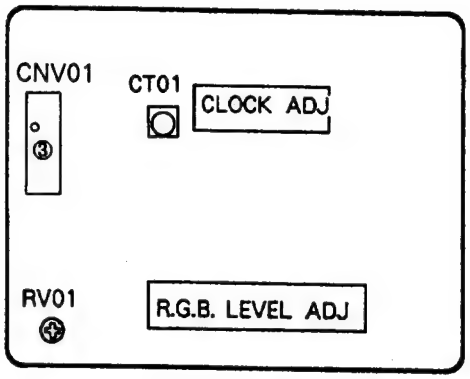
RV1501
PIN. COR (PINCUSHION CORRECT)



RV1505
CORNER COR (CORNER CORRECT)



4-5. V BOARD ADJUSTMENTS



(COMPONENT SIDE)

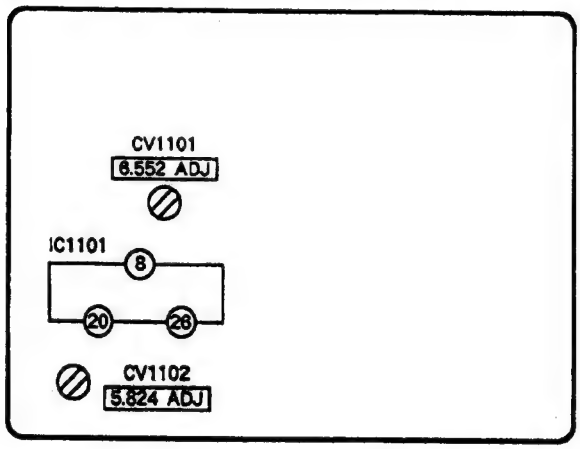
CLOCK ADJUSTMENT (CT01)

1. Remove the pin ③ of V-01 connector.
2. Put the system into text mode.
3. Adjust CT01 so that the picture does not move.

RGB LEVEL ADJUSTMENT (RV01)

1. Maximize the picture setting.
2. Adjust RV01 so that the RGB output is 0.75V.

4-6. A1 BOARD ADJUSTMENTS



(COMPONENT SIDE)

6.552MHz (CARRIER Freq) Adjustment (CV1101)

1. Tune in NICAM signal.
2. Connect the frequency counter to pin ⑧ of IC1101.
3. Adjust CV1101 so that frequency becomes 6.552MHz±30Hz.

- Confirmation

  Connect X input of oscilloscope to IC1101 pin ⑲, and Y to pin ⑳.

  Confirm waveform by X-Y mode.

  Confirm that waveform as OK in Fig observed clearly and without tilt.

5.824MHz (Clock Freq) Adjustment (CV1102)

1. Tune in a NICAM signal.
2. Connect the frequency counter to pin ㉖ of IC1101.
3. Adjust CV1102 so that frequency becomes 5.824MHz±30Hz.

OK NG NG

4-6. SECONDARY ADJUSTMENT

SUB BRIGHTNESS ADJUSTMENT

1. Set the system to receive a test pattern.
2. Press →•← on the remote commander to put the system into normal mode.
3. Switch off the power.
4. While depressing the adjusting buttons + and − simultaneusly, turn on the power. (SUB mode is obtained)
5. Minimize the ◑ contrast setting.
6. Adjust the ☼ brightness control so that the gray scale 0 IRE section is cut off completely and the 20 IRE section is barely glowing.
7. Depress the ◇ (store) button of the remote commander.
   (SUB mode is released)

If there is no test color pattern

1. Set the system to receive a color pattern.
2. Press on the remote commander to put system into normal mode.
   Set the ◒ color to its normal state.

3-5. are the same as above.

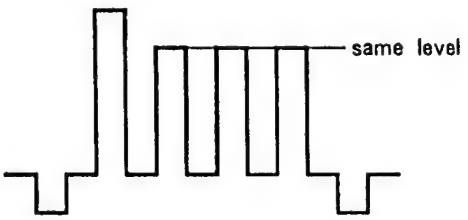
6. Since 20 IRE is nearly blue, adjust the ☼ brightness control so that the blue barely glows.

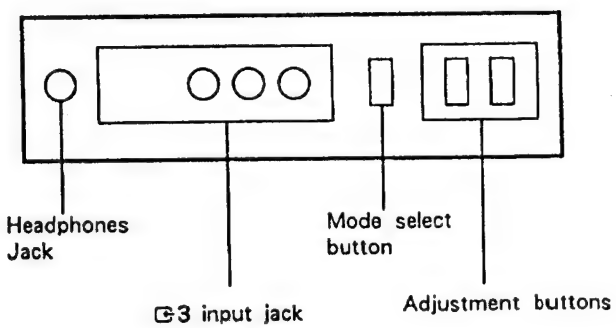
7. is the same as above.

8. Press →•← on the remote commander to put the system into normal mode.

SUB COLOR ADJUSTMENT

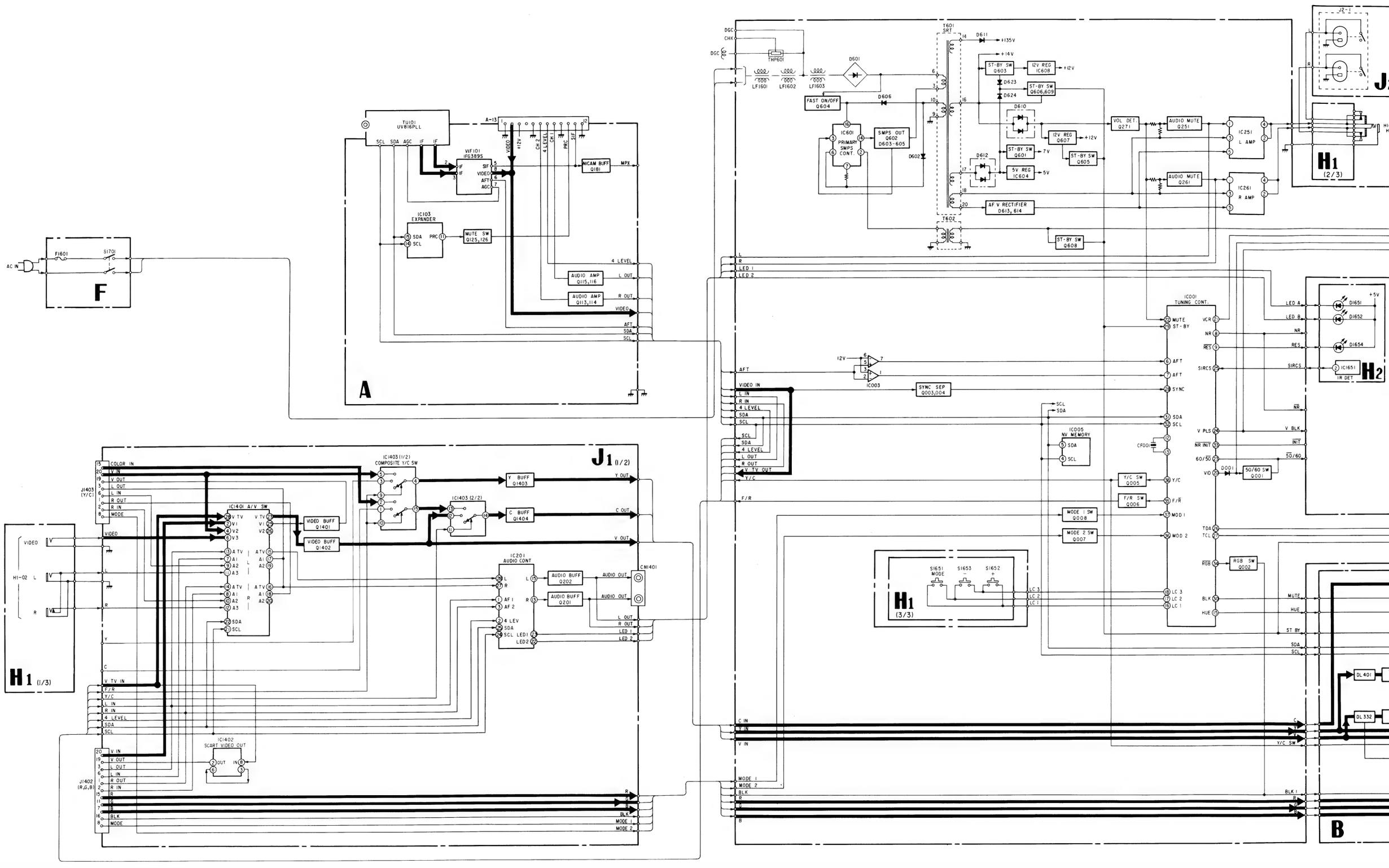
1. Set the system to receive color bars.
2. Press →•← on the remote commander to put the system into normal mode.
3. Cut off the power.
4. While depressing the adjustment buttons + and − simultaneusly, turn on the power. (SUB mode is obtained)
5. Adjust the color control so that the B out waveform (pin ② of C board connector CNC72) is as shown in the figure below.
6. Depress the ◇ (store) button of the remote commander. (SUB mode is released)

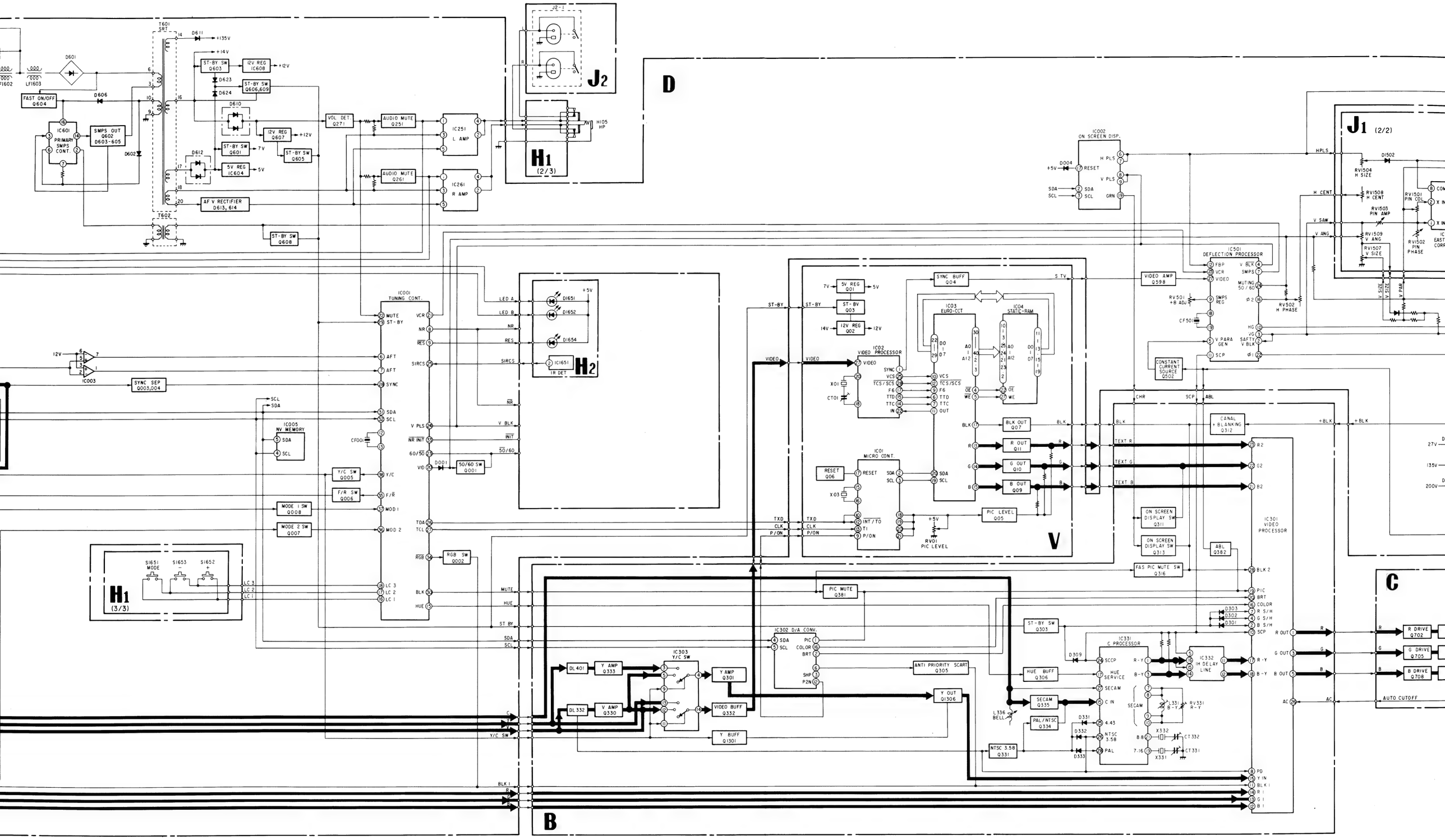


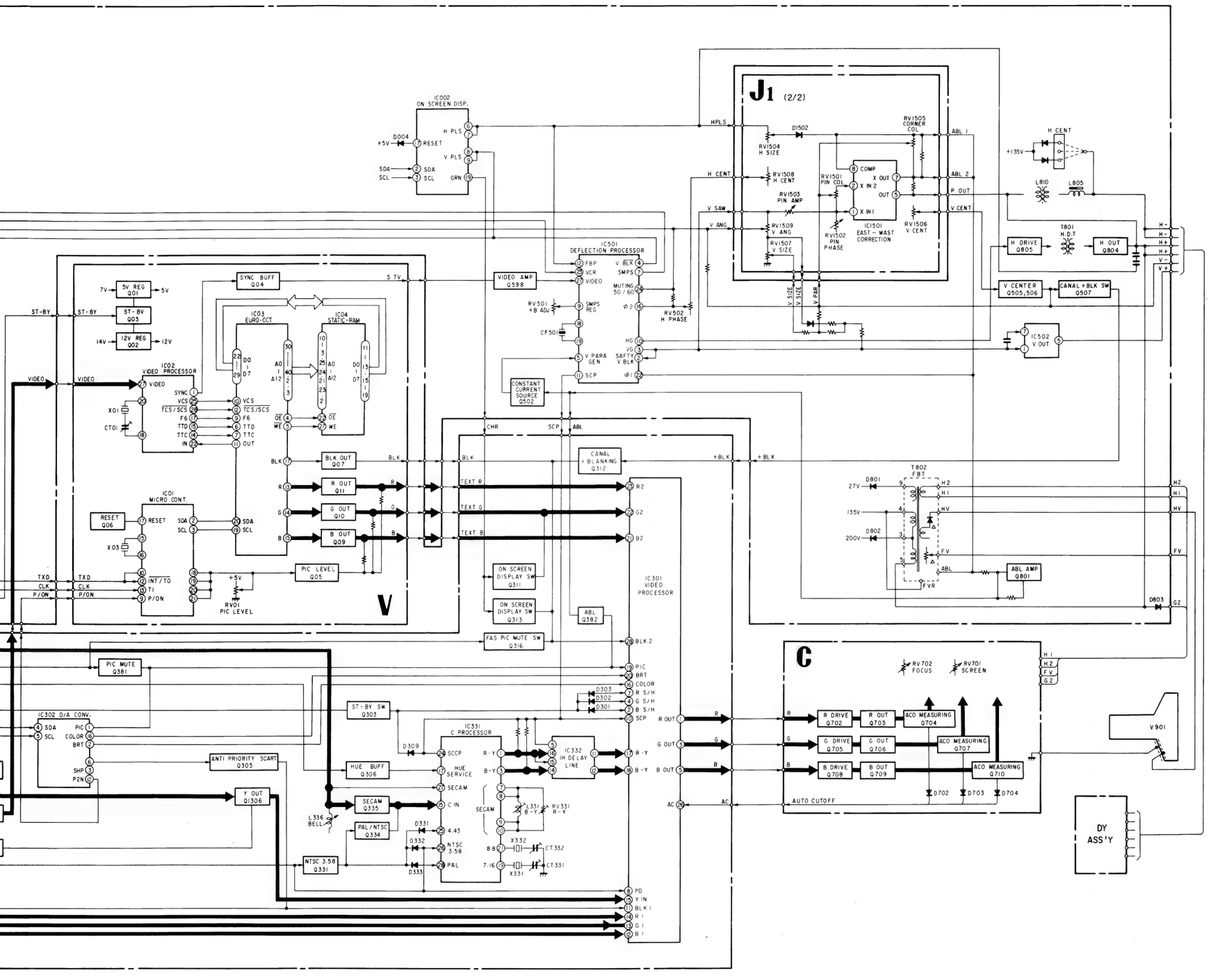


MEMO

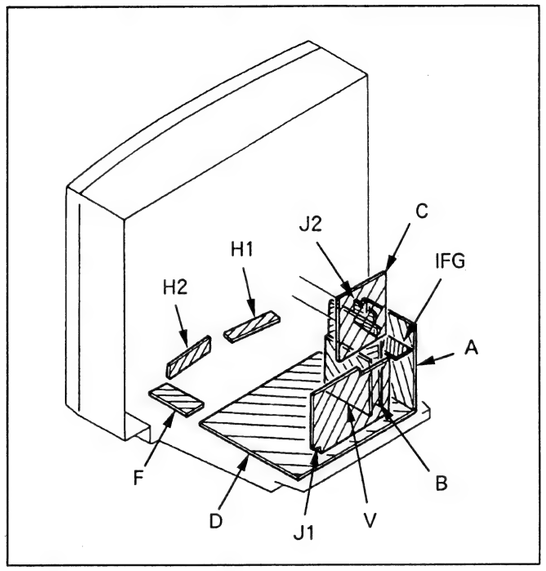
DIAGRAMS


F
A
H1 (1/3)
H1 (2/3)
H1 (3/3)
J1 (1/2)
B
TU101 UV816PLL
VIF101 IFG3895
IC103 EXPANDER
NICAM BUFF Q181
MUTE SW Q125,126
AUDIO AMP Q115,116
AUDIO AMP Q113,114
IC1401 A/V SW
IC1403 (1/2) COMPOSITE Y/C SW
IC1403 (2/2)
VIDEO BUFF Q1401
VIDEO BUFF Q1402
Y BUFF Q1403
C BUFF Q1404
IC201 AUDIO CONT
AUDIO BUFF Q202
AUDIO BUFF Q201
IC1402 SCART VIDEO OUT
CN1401
T601 SRT
T602
FAST ON/OFF Q604
SMPS OUT Q602 D603-605
IC601 PRIMARY SMPS CONT.
ST-BY SW Q603
12V REG IC608
ST-BY SW Q606,609
ST-BY SW Q601
12V REG Q607
5V REG IC604
ST-BY SW Q605
ST-BY SW Q608
AF V RECTIFIER D613,614
VOL DET Q271
AUDIO MUTE Q251
AUDIO MUTE Q261
IC251 L AMP
IC261 R AMP
IC001 TUNING CONT.
IC003
SYNC SEP Q003,004
IC005 NV MEMORY
CF001
DO01
50/60 SW Q001
Y/C SW Q005
F/R SW Q006
MODE 1 SW Q008
MODE 2 SW Q007
RGB SW Q002
S1651 MODE
S1653 –
S1652 +
DI651
DI652
DI654
IC1651 IR DET.
DL401
DL332


D
J2
H1 (2/3)
H1 (3/3)
H2
J1 (2/2)
C
B
V
T601 SRT
T602
D611
D601
D606
D610
D612
D623
D624
D602
D604
D1502
D1651
D1652
D1654
IC1651 IR DET.
IC001 TUNING CONT.
IC002 ON SCREEN DISP.
IC003
IC005 NV MEMORY
IC251 L AMP
IC261 R AMP
IC501 DEFLECTION PROCESSOR
IC01 MICRO CONT.
IC02 VIDEO PROCESSOR
IC03 EURO-CCT
IC04 STATIC-RAM
IC301 VIDEO PROCESSOR
IC302 D/A CONV.
IC303 Y/C SW
IC331 C PROCESSOR
IC332 1H DELAY LINE
FAST ON/OFF Q604
PRIMARY SMPS CONT.
SMPS OUT Q602 Q603-605
ST-BY SW Q603
ST-BY SW Q606,609
ST-BY SW Q601
ST-BY SW Q605
ST-BY SW Q608
12V REG IC608
12V REG Q607
5V REG IC604
VOL DET. Q271
AUDIO MUTE Q251
AUDIO MUTE Q261
AF V RECTIFIER D613, 614
+135V
+14V
+12V
7V
5V
HI05 HP
5V REG Q01
ST-BY Q03
12V REG Q02
SYNC BUFF Q04
PIC LEVEL Q05
RESET Q06
BLK OUT Q07
R OUT Q11
G OUT Q10
B OUT Q09
VIDEO AMP Q598
CONSTANT CURRENT SOURCE Q502
CANAL + BLANKING Q312
ON SCREEN DISPLAY SW Q311
ON SCREEN DISPLAY SW Q313
ABL Q382
FAS PIC MUTE SW Q316
PIC MUTE Q381
ST-BY SW Q303
HUE BUFF Q306
SECAM Q335
PAL/NTSC Q334
NTSC 3.58 Q331
ANTI PRIORITY SCART Q305
Y OUT Q1306
Y AMP Q301
VIDEO BUFF Q332
Y BUFF Q1301
Y AMP Q333
V AMP Q330
DL 401
DL 332
SYNC SEP Q003,004
Y/C SW Q005
F/R SW Q006
MODE 1 SW Q008
MODE 2 SW Q007
RGB SW Q002
50/60 SW Q001
R DRIVE Q702
G DRIVE Q705
B DRIVE Q708
RV501 +B ADJ
RV502 H PHASE
RV503 PIN AMP
RV504 H SIZE
RV505 H CENT
RV506 PIN COL
RV507 V SIZE
RV508 V CENT
RV509 V ANG
RV502 PIN PHASE
RV01 PIC LEVEL
RV331 R-Y
L331 B-Y
L336 BELL
CF501
CT331
CT332
X01
X03
X331
X332
S1651 MODE
S1653 −
S1652 +
HPLS
VPLS
H CENT
V SAW
V ANG
V SIZE
V PARA
ST-BY
VIDEO
SCL
SDA
AUTO CUTOFF


J1 (2/2)
IC002 ON SCREEN DISP.
H PLS
V PLS
SDA
SCL
RESET
+5V
D004
IC501 DEFLECTION PROCESSOR
FBP
VCR
VIDEO
V BLK
SMPS
MUTING 50/60
SMPS REG
V PARA GEN
SCP
HG
VG
SAFTY V BLK
VIDEO AMP Q598
RV501 +B ADJ
RV502 H PHASE
CF501
CONSTANT CURRENT SOURCE Q502
HPLS
H CENT
V SAW
V ANG
D1502
RV1504 H SIZE
RV1508 H CENT
RV1503 PIN AMP
RV1509 V ANG
RV1507 V SIZE
RV1501 PIN COL
RV1502 PIN PHASE
IC1501 EAST-WAST CORRECTION
RV1505 CORNER COL
RV1506 V CENT
ABL 1
ABL 2
P OUT
V CENT
V SIZE
V PAR
H CENT
+135V
L810
L805
T801 H.D.T
H DRIVE Q805
H OUT Q804
V CENTER Q505,506
CANAL + BLK SW Q507
IC502 V OUT
H -
H -
H +
H +
V -
V +
5V REG Q01
12V REG Q02
ST-BY Q03
SYNC BUFF Q04
S TV
7V
5V
14V
12V
ST-BY
VIDEO
IC02 VIDEO PROCESSOR
SYNC
VCS
TCS/SCS
F6
TTD
TTC
OUT
XO1
CTO1
IC03 EURO-CCT
IC04 STATIC-RAM
D0 I D7
A0 I A12
OE
WE
BLK
R
G
B
BLK OUT Q07
R OUT Q11
G OUT Q10
B OUT Q09
IC01 MICRO CONT.
RESET Q06
X03
INT/TO
TI
P/ON
TXD
CLK
P/ON
PIC LEVEL Q05
RV01 PIC LEVEL
+5V
V
CHR
SCP
ABL
CANAL + BLANKING Q312
+BLK
TEXT R
TEXT G
TEXT B
R2
G2
B2
ON SCREEN DISPLAY SW Q311
ON SCREEN DISPLAY SW Q313
ABL Q382
FAS PIC MUTE SW Q316
IC301 VIDEO PROCESSOR
BLK 2
PIC
BRT
COLOR
R S/H
G S/H
B S/H
SCP
PD
Y IN
BLK I
R I
G I
B I
PIC MUTE Q381
IC302 D/A CONV.
SDA
SCL
PIC
COLOR
BRT
SHP
P2N
ANTI PRIORITY SCART Q305
Y OUT Q1306
ST-BY SW Q303
D303
D302
D301
IC331 C PROCESSOR
SCCP
HUE SERVICE
SECAM
C IN
4.43
NTSC 3.58
PAL
R-Y
B-Y
HUE BUFF Q306
SECAM Q335
PAL/NTSC Q334
NTSC 3.58 Q331
L336 BELL
D309
D331
D332
D333
IC332 1H DELAY LINE
L331 B-Y
RV331 R-Y
X332
X331
CT332
CT331
R OUT
G OUT
B OUT
AC
T802 FBT
D801
D802
27V
135V
200V
H2
H1
HV
FV
FVR
ABL
ABL AMP Q801
D803
G2
C
RV702 FOCUS
RV701 SCREEN
R DRIVE Q702
G DRIVE Q705
B DRIVE Q708
R OUT Q703
G OUT Q706
B OUT Q709
ACO MEASURING Q704
ACO MEASURING Q707
ACO MEASURING Q710
D702
D703
D704
AUTO CUTOFF
V901
DY ASS'Y

5-2. CIRCUIT BOARDS LOCATION



Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Note :

- All capacitors are in μF unless otherwise noted. pF : μμF 50WV or less are not indicated except for electrolytics.
- Indication of resistance, which does not have one for rating electrical power, is as follows.

Pitch : 5mm Rating electrical power : 1/4W

- Chip resistor is in 1/10W.
- All resistors are in ohms. kΩ = 1000Ω, MΩ = 1000k Ω
- : nonflammable resistor.
- : fusible resistor.
- △ : internal component.
- : panel designation and adjustment for repair.
- All variable and adjustable resistors have characteristic curve B.unless otherwise noted.
- All voltages are in V.
- Readings are taken with a 10MΩ digital multimeter.
- Readings are taken with a color-bar signal input.
- Voltage variations may be noted due to normal production tolerances.
- : B + line.
- : signal path.

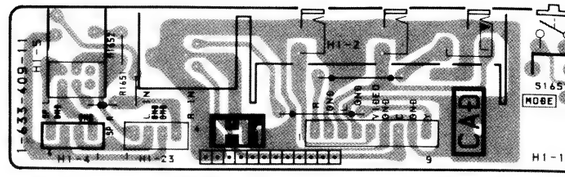
Reference information

RESISTOR	: RN	METAL FILM
	: RC	SOLID
	: FPRD	NONFLAMMABLE CARBON
	: FUSE	NONFLAMMABLE FUSIBLE
	: RS	NONFLAMMABLE METAL OXIDE
	: RB	NONFLAMMABLE CEMENT
	: RW	NONFLAMMABLE WIREWOUND
	: ✱	ADJUSTMENT RESISTOR
COIL	: LF-8L	MICRO INDUCTOR
CAPACITOR	: TA	TANTALUM
	: PS	STYROL
	: PP	POLYPROPYLENE
	: PT	MYLAR
	: MPS	METALIZED POLYESTER
	: MPP	METALIZED POLYPROPYLENE
	: ALB	BIPOLAR
	: ALT	HIGH TEMPERATURE
	: ALR	HIGH RIPPLE

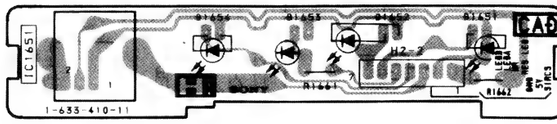
5-3. SCHEMATIC DIAGRAMS AND PRINTED WIRING BOARDS

–Conductor Side–

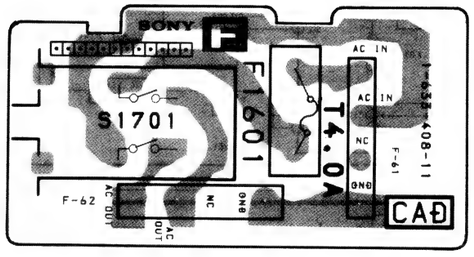
–H1 Board–



–H2 Board–



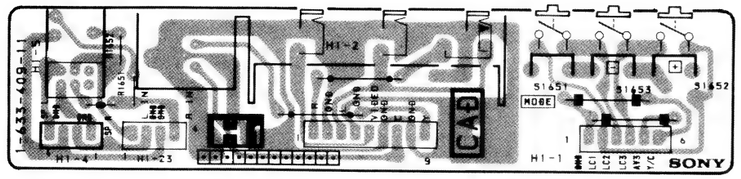
–F Board–



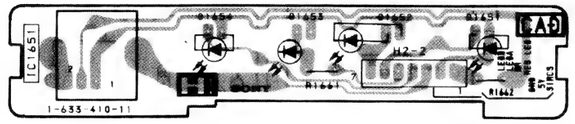
5-3. SCHEMATIC DIAGRAMS AND PRINTED WIRING BOARDS

– Conductor Side –

– H1 Board –

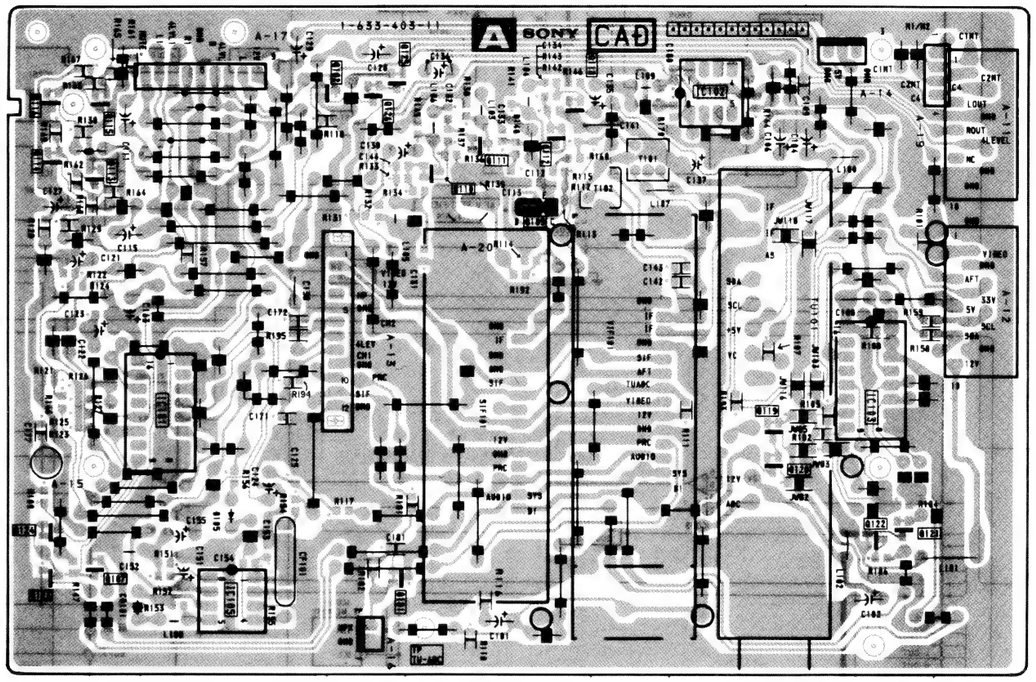


– H2 Board –

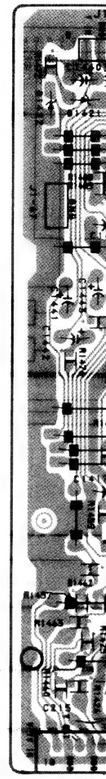


– F Board –

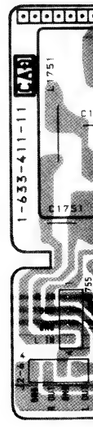
– A Board –



– J1 Boa

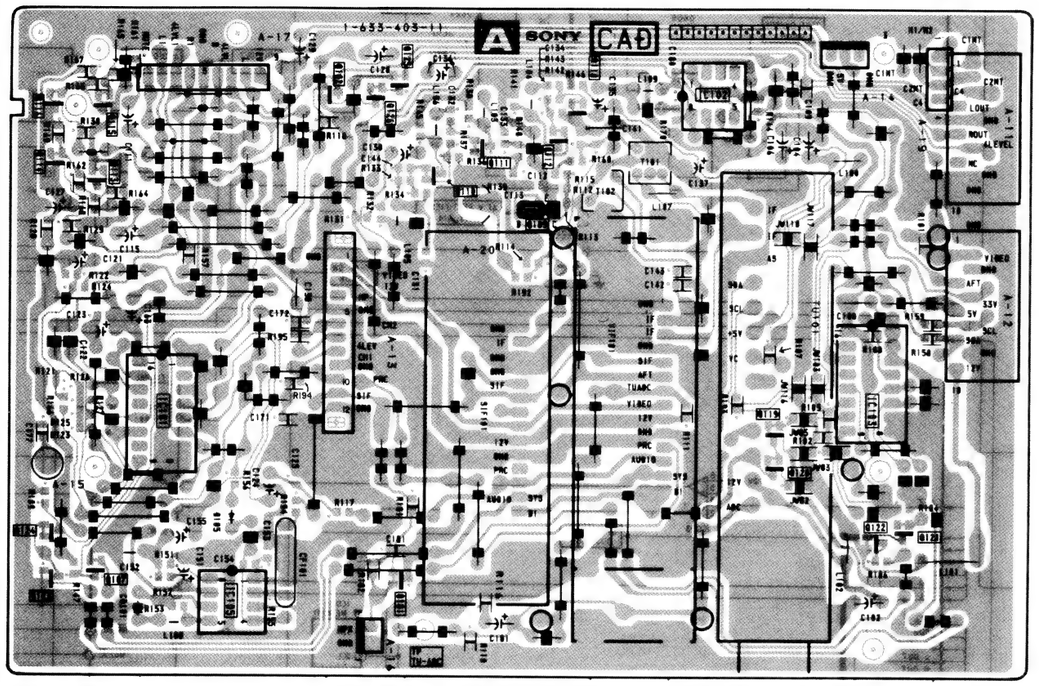


– J2 Boa



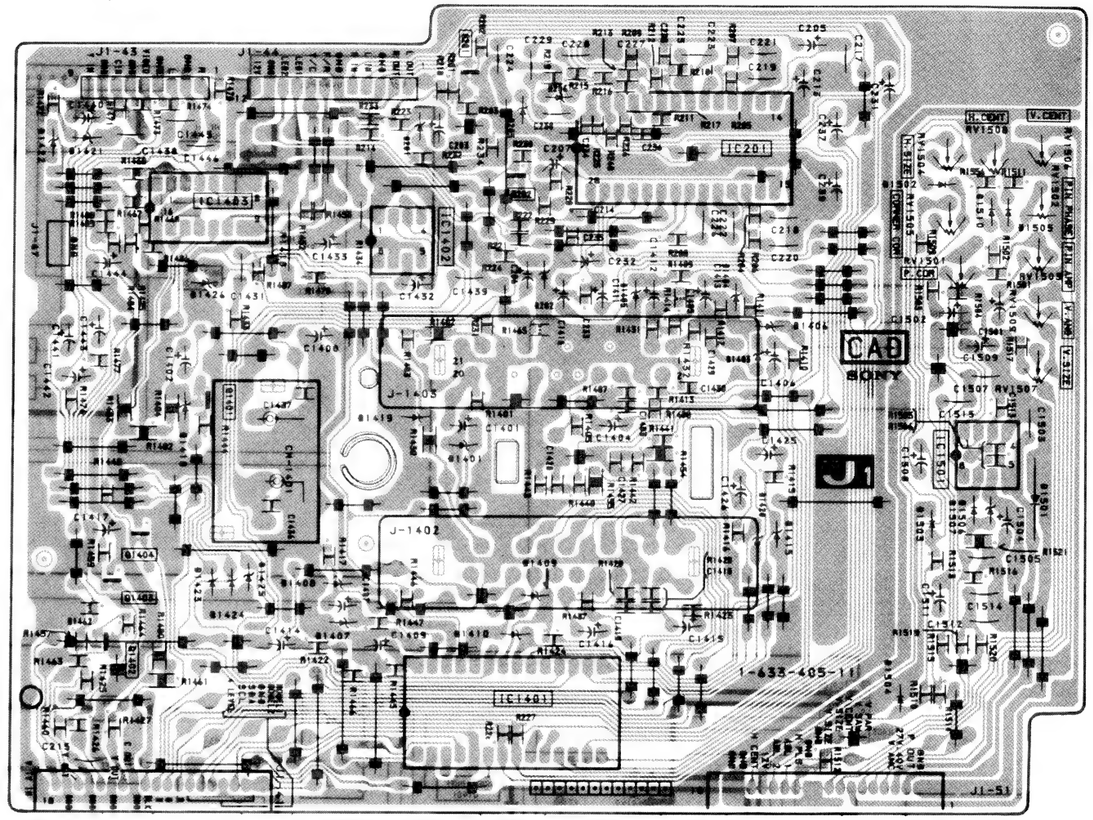
[TUNER, VIF, SIF] A

—A Board—

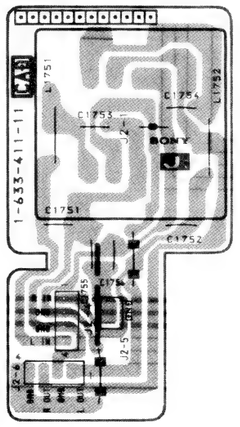


J1 [AUDIO CONTROL, AV INPUT Y/C INPUT, SCAR VIDEO OUT EAST-WEST CORRECTION] J2 [SPEAKER TERMINAL]

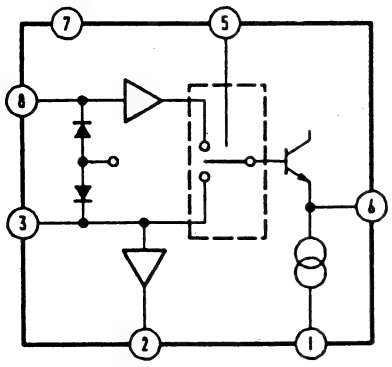
—J1 Board—



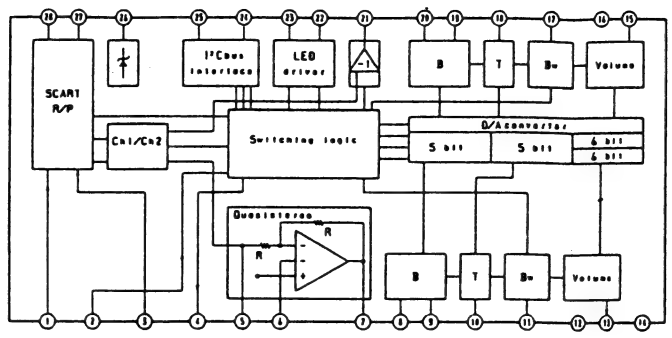
—J2 Board—



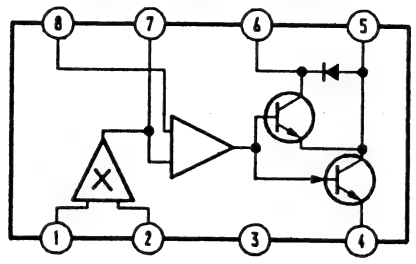
J1 BOARD IC1402 TEA2014A



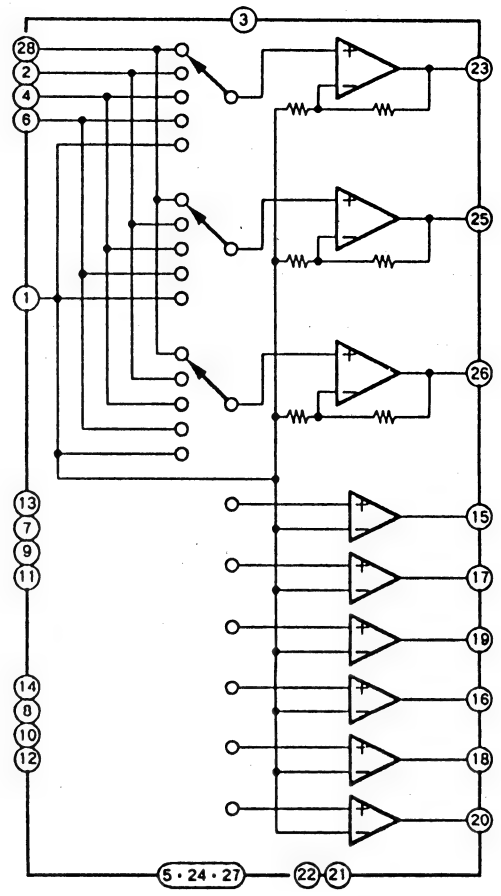
J1 BOARD IC201 TDA6200



J1 BOARD IC1501 TEA2031



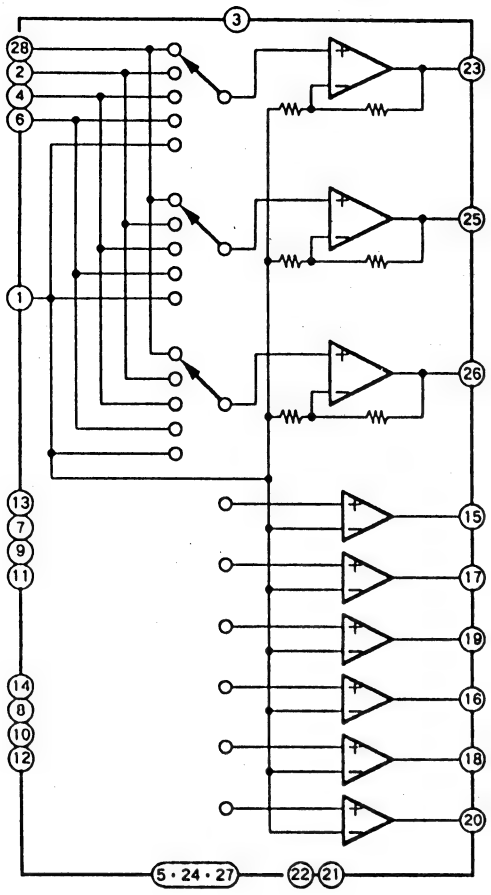
J1 BOARD IC1401 CXA1114P



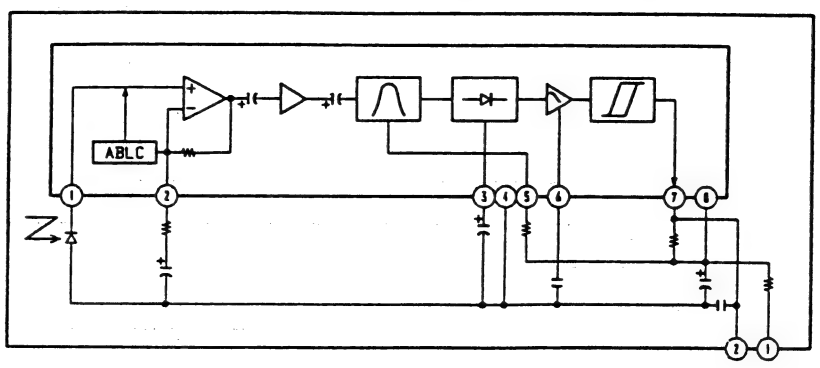
J1

AUDIO CONTROL,
AV INPUT,
Y/C INPUT,
SCART VIDEO OUT,
EAST-WEST CORRECTION

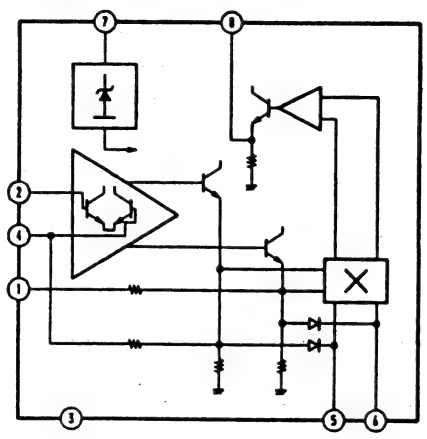
J1 BOARD IC1401 CXA1114P



H2 BOARD IC1651 BA1387



A BOARD IC105 TBA129



TO H1 BOARD J2-4
4P
WHT-L
:S-MICRO

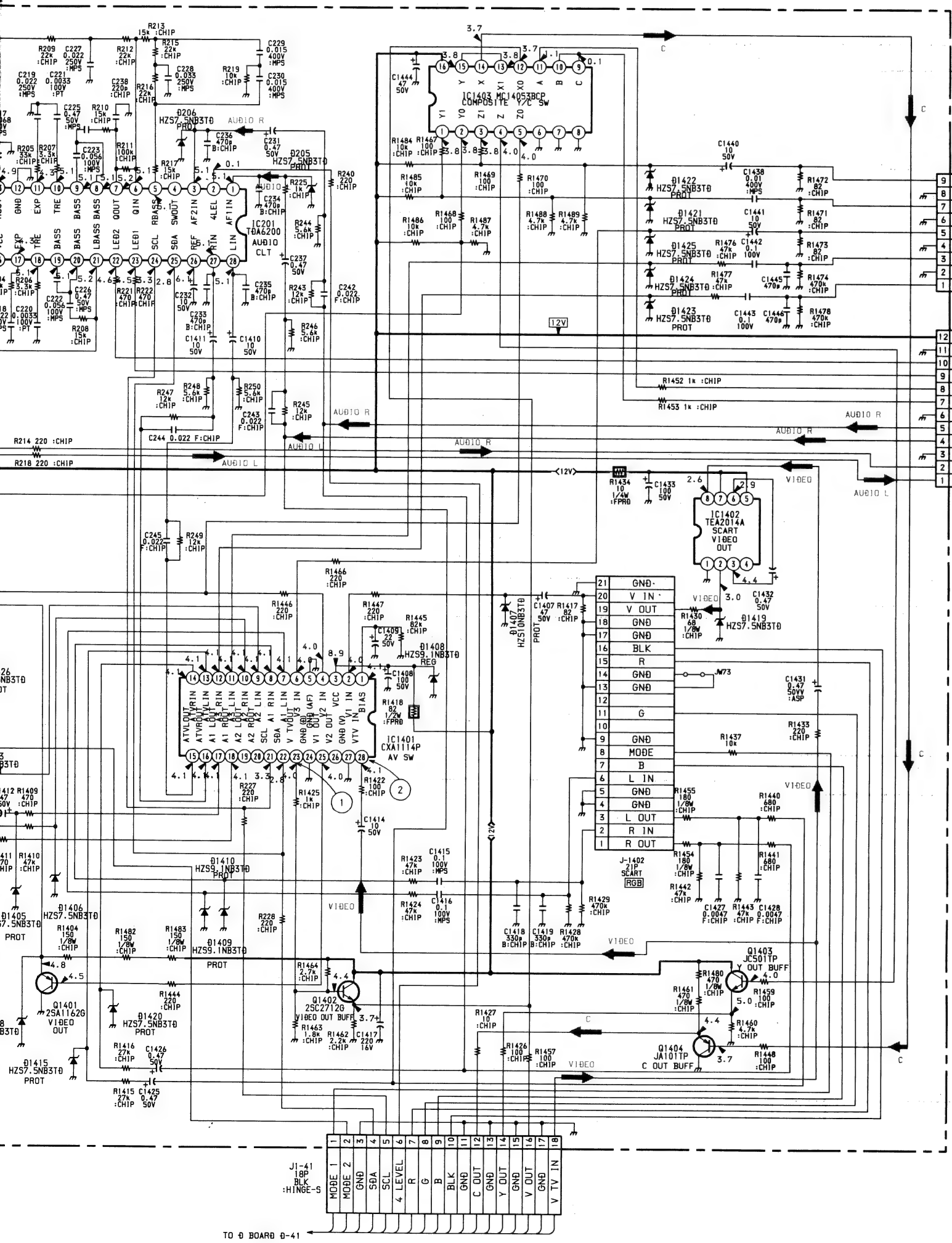
L IN
GND
GND
R IN

J2-5
2P
WHT-L
:S-MICRO

GND
GND

H2
SIRCS RECEIVER INDICATOR

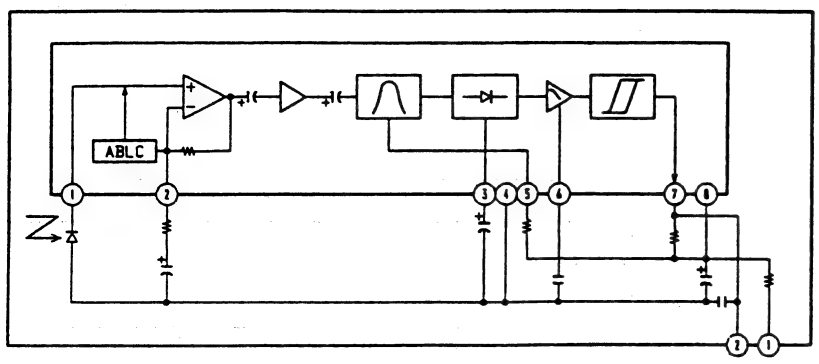
LED B	LED A	RES. LED	GND	5V	SIRCS		
7	6	5	4	3	2	1	



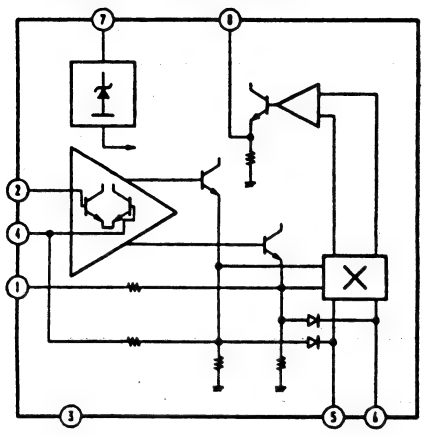
• WAVEFORMS J1 BOARD

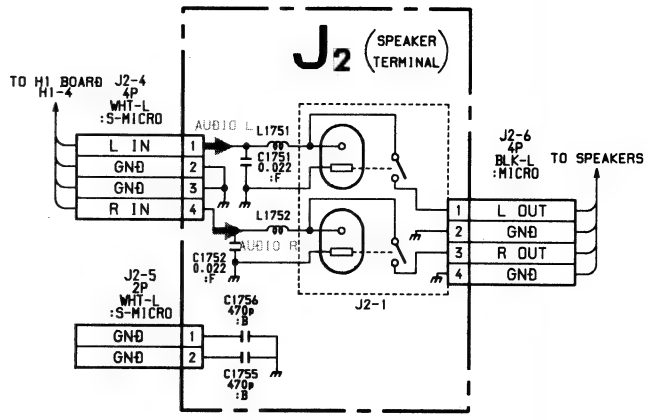
①	②
2.0Vp-p (H)	2.0Vp-p (

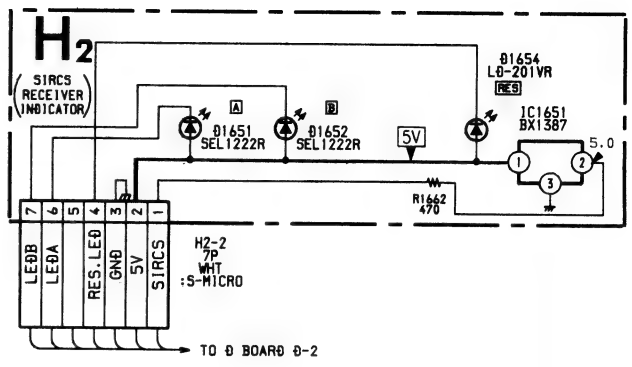
H2 BOARD IC1651 BA1387



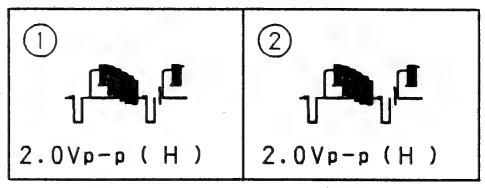
A BOARD IC105 TBA129



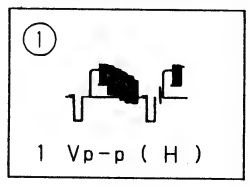


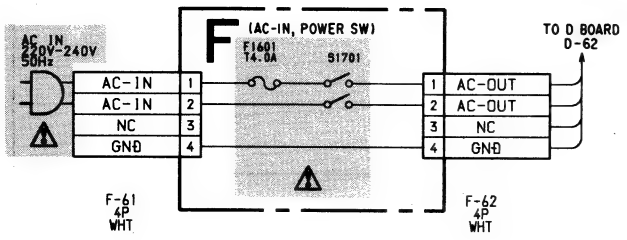


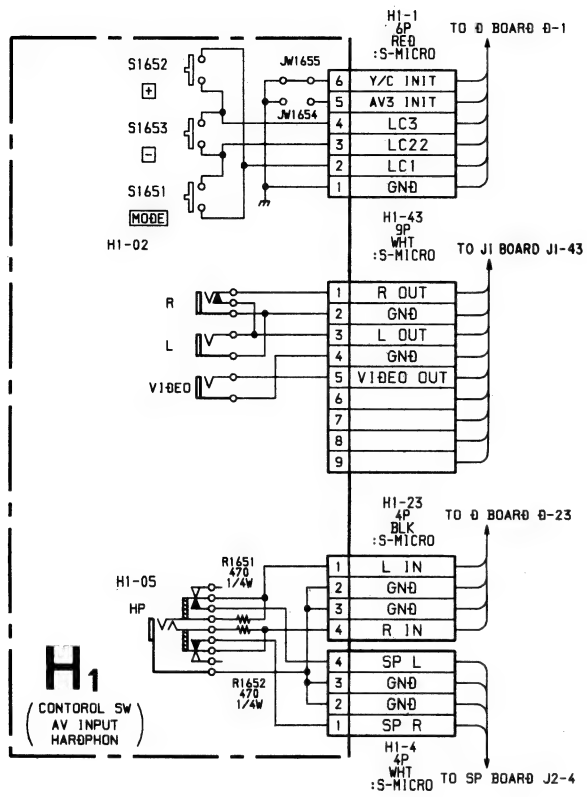
• WAVEFORMS J1 BOARD

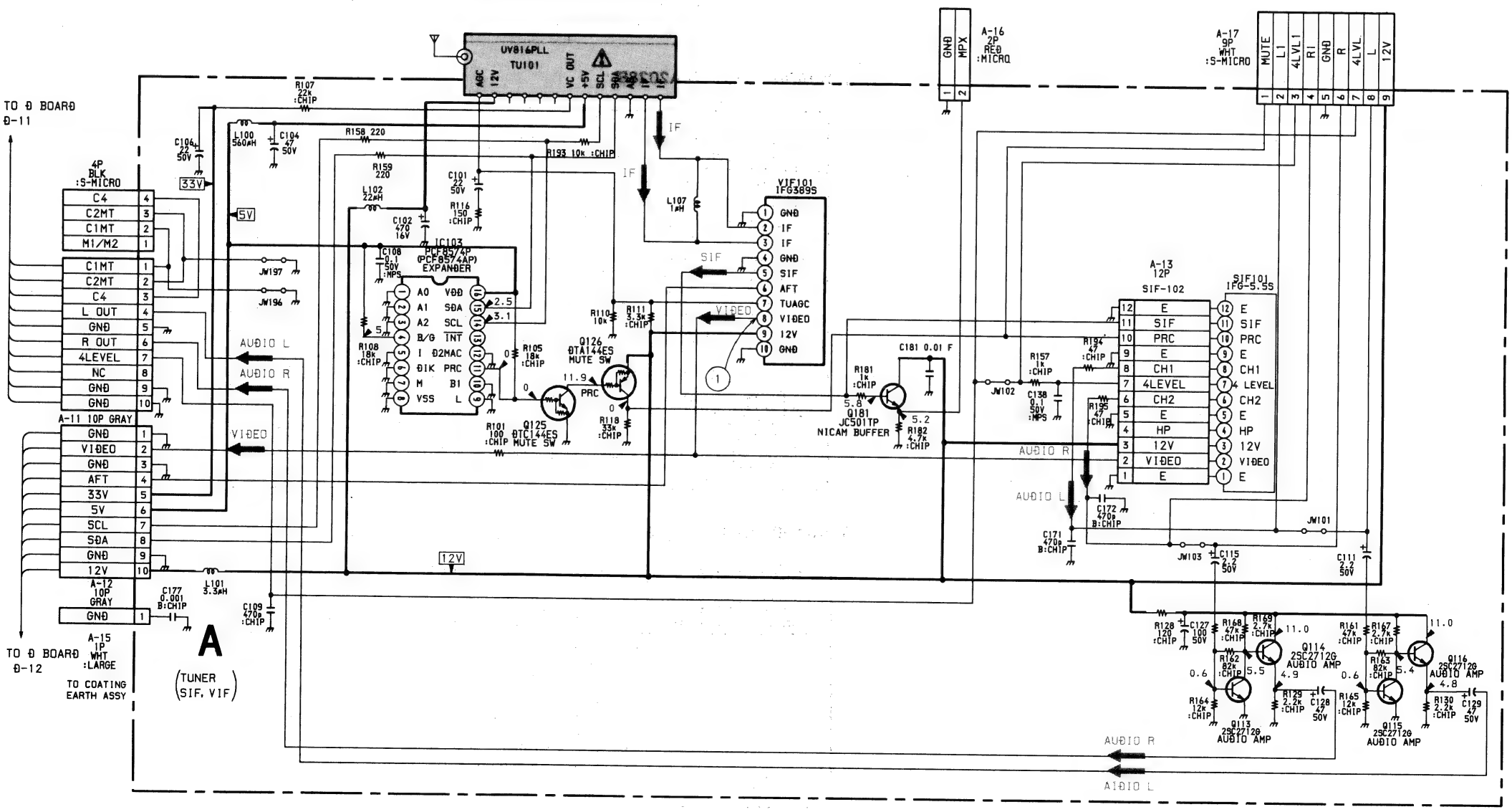


• WAVEFORMS A BOARD




AC IN
220V-240V
50Hz
F (AC-IN, POWER SW)
F1601
T4.0A
S1701
AC-IN
AC-IN
NC
GND
AC-OUT
AC-OUT
NC
GND
TO D BOARD
D-62
F-61
4P
WHT
F-62
4P
WHT

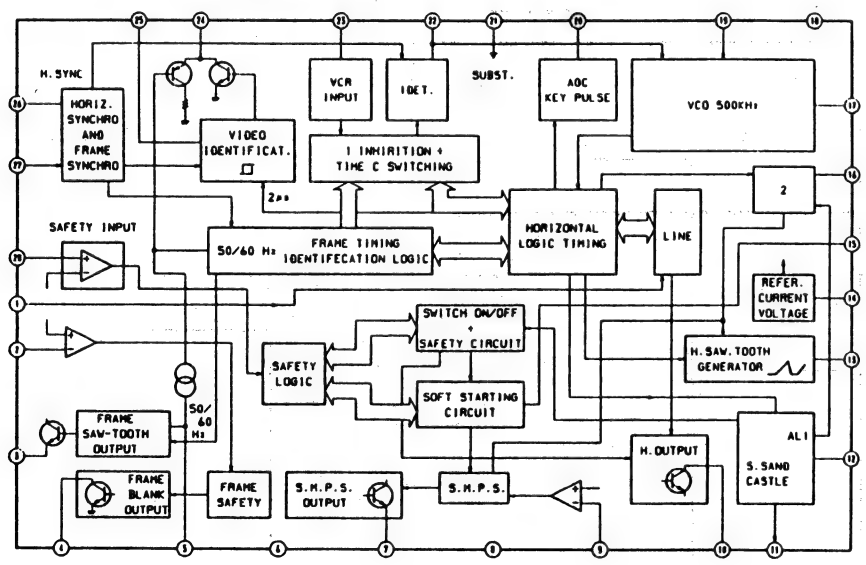

H1-1
6P
RED
:S-MICRO
TO D BOARD D-1
S1652
S1653
S1651
MODE
H1-02
JW1655
JW1654
Y/C INIT
AV3 INIT
LC3
LC22
LC1
GND
H1-43
9P
WHT
:S-MICRO
TO J1 BOARD J1-43
R
L
VIDEO
R OUT
GND
L OUT
GND
VIDEO OUT
H1-23
4P
BLK
:S-MICRO
TO D BOARD D-23
H1-05
HP
R1651
470
1/4W
R1652
470
1/4W
L IN
GND
GND
R IN
SP L
GND
GND
SP R
H1-4
4P
WHT
:S-MICRO
TO SP BOARD J2-4
H1
CONTOROL SW
AV INPUT
HARDPHON


TO D BOARD
D-11
4P
BLK
:S-MICRO
C4
C2MT
C1MT
M1/M2
C1MT
C2MT
C4
L OUT
GND
R OUT
4LEVEL
NC
GND
GND
A-11 10P GRAY
GND
VIDEO
GND
AFT
33V
5V
SCL
SDA
GND
12V
A-12
10P
GRAY
GND
TO D BOARD
D-12
A-15
1P
WHT
:LARGE
TO COATING
EARTH ASSY
A
(TUNER
SIF, VIF)
UV814PLL
TU101
AGC
12V
VC OUT
+5V
SCL
SDA
R107
22k
:CHIP
L100
560nH
C104
47
50V
C106
22
50V
R158 220
R159
220
R193 10k :CHIP
C101
22
50V
R116
150
:CHIP
L102
22uH
C102
470
16V
IC103
PCF8574P
(PCF8574AP)
EXPANDER
C108
0.1
50V
:MPS
A0
A1
A2
B/G
I
DIK
M
VSS
VDD
SDA
SCL
INT
D2MAC
PRC
BI
L
R108
18k
:CHIP
R105
18k
:CHIP
Q126
DTA144ES
MUTE SW
R110
10k
R111
3.3k
:CHIP
Q125
DTC144ES
MUTE SW
R101
100
:CHIP
R118
33k
:CHIP
PRC
IF
SIF
VIDEO
L107
1uH
VIF101
IFG3895
GND
IF
IF
GND
SIF
AFT
TUAGC
VIDEO
12V
GND
C181 0.01 F
R181
1k
:CHIP
Q181
JC501TP
NICAM BUFFER
R182
4.7k
:CHIP
JW102
C138
0.1
50V
:MPS
R157
1k
:CHIP
R194
47
:CHIP
R195
47
:CHIP
A-16
2P
RED
:MICRO
GND
MPX
A-17
9P
WHT
:S-MICRO
MUTE
L1
4LVL1
R1
GND
R
4LVL
L
12V
A-13
12P
SIF-102
SIF101
IFG-5.5S
E
SIF
PRC
E
CH1
4LEVEL
CH2
E
HP
12V
VIDEO
E
JW197
JW196
JW101
JW103
C172
470p
B:CHIP
C171
470p
B:CHIP
C115
2.2
50V
C111
2.2
50V
C177
0.001
B:CHIP
L101
3.3uH
C109
470p
:CHIP
R128
120
:CHIP
C127
100
50V
R168
47k
:CHIP
R169
2.7k
:CHIP
R162
82k
:CHIP
Q114
2SC2712G
AUDIO AMP
R164
12k
:CHIP
R129
2.2k
:CHIP
C128
47
50V
Q113
2SC2712G
AUDIO AMP
R161
47k
:CHIP
R167
2.7k
:CHIP
R163
82k
:CHIP
Q116
2SC2712G
AUDIO AMP
R165
12k
:CHIP
R130
2.2k
:CHIP
C129
47
50V
Q115
2SC2712G
AUDIO AMP
AUDIO L
AUDIO R
VIDEO
AUDIO R
AUDIO L
AUDIO R
AUDIO L
5V
33V
12V

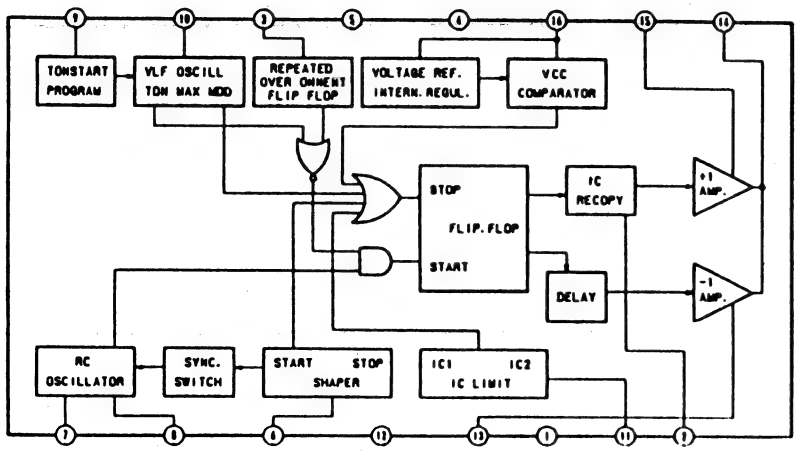
• WAVEFORMS D BOARD

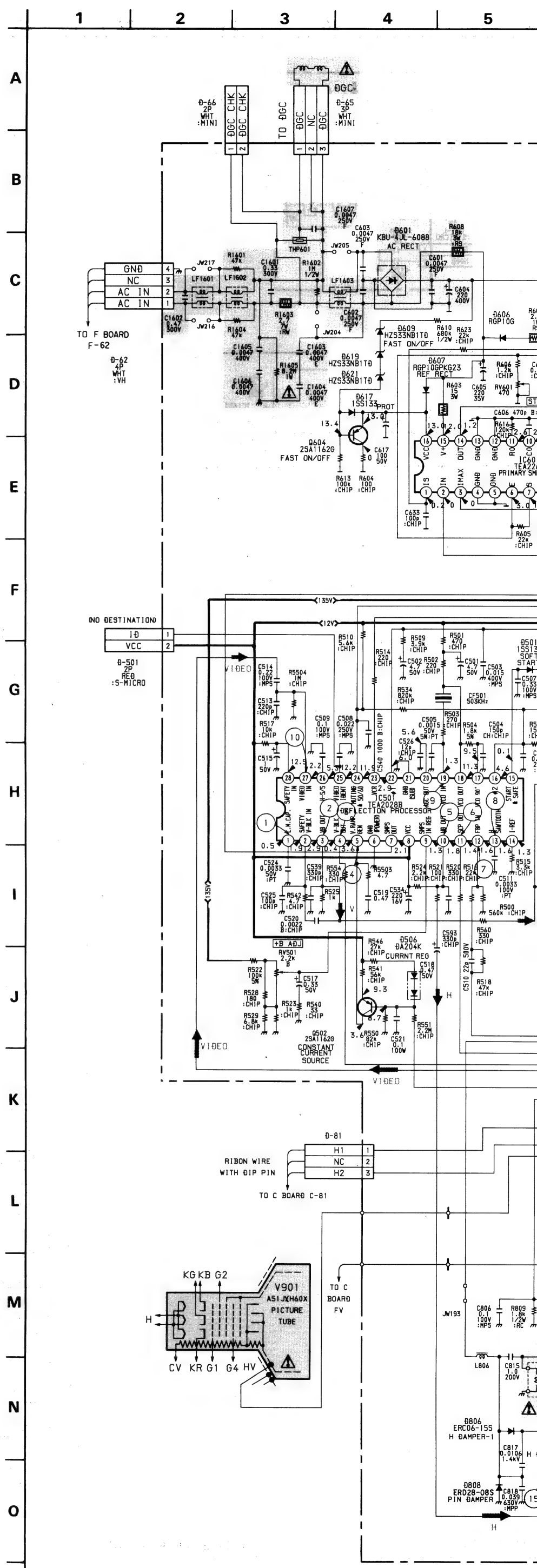
① 1.2Vp-p (H)	② 3.2 Vp-p(V)	③ 5.0 Vp-p (V)
④ 3.3Vp-p (V)	⑤ 3.4Vp-p (H)	⑥ 10.0 Vp-p (H)
⑦ 12.0Vp-p (H)	⑧ 3.0Vp-p (H)	⑨ 0.1Vp-p(503KHz)
⑩ 1.0Vp-p (H)	⑪ 0.56Vp-p (V)	⑫ 2.0Vp-p (V)
⑬ 29 Vp-p (V)	⑭ 48 Vp-p (V)	⑮ 2.8Vp-p (H)
⑯ 230Vp-p (H)	⑰ 11.5Vp-p (H)	⑱ 800Vp-p (H)
⑲ 165Vp-p (H)	⑳ 6.8 Vp-p(V)	㉑ 48 Vp-p (V)
㉒ 1.2Vp-p (H)	㉓ 9.0Vp-p (H)	㉔ 3.6Vp-p(12MHz)
㉕ 4.0Vp-p (H)	㉖ 5.6Vp-p (H)	㉗ 4.8Vp-p (V)

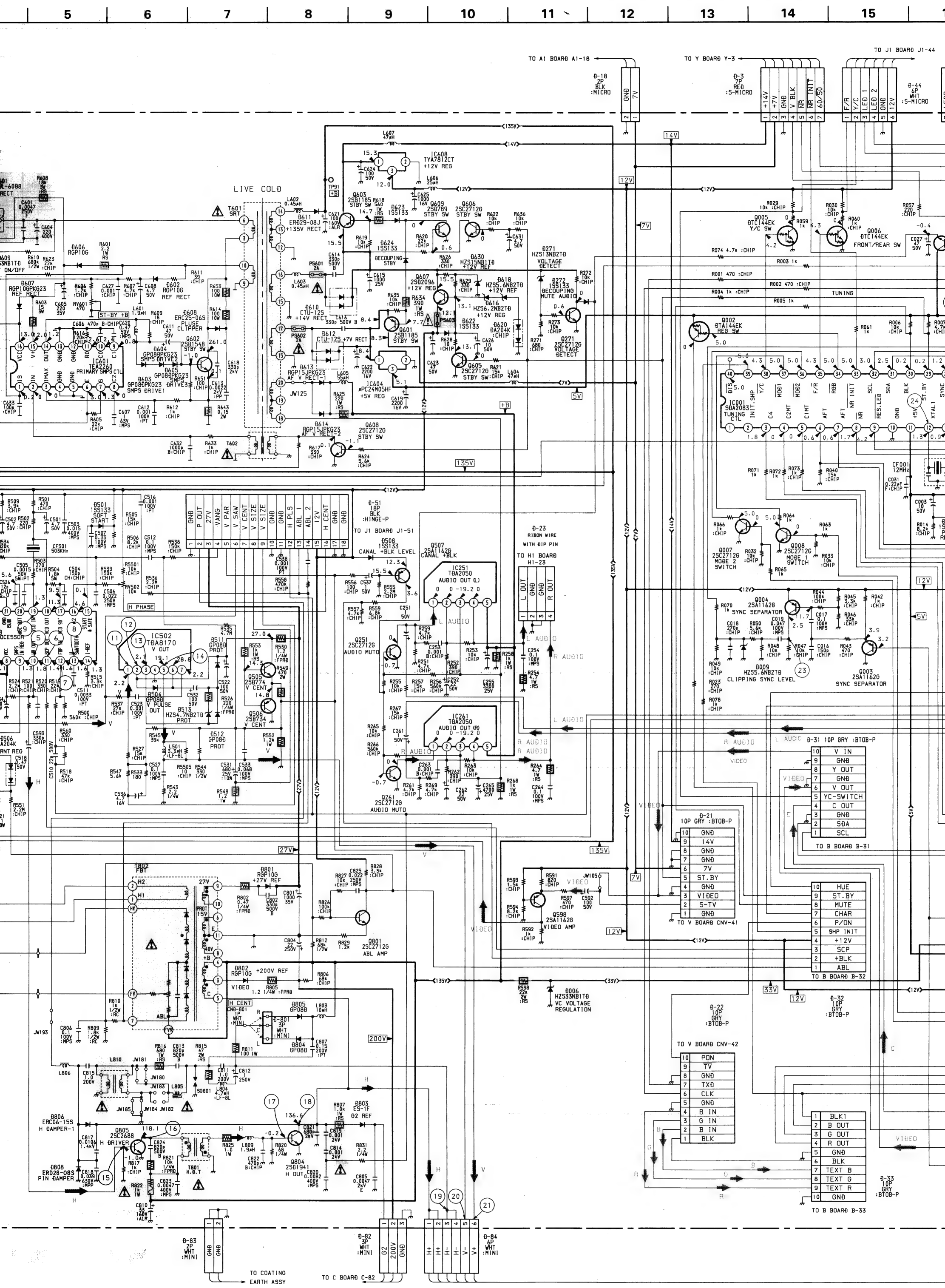
D BOARD IC501 TEA2028B



D BOARD IC601 TEA2260






TO A1 BOARD A1-18
TO Y BOARD Y-3
TO J1 BOARD J1-44
LIVE COLD
IC608 TYA7812CT +12V REG
IC601 TEA2260 PRIMARY SMPS CTL
IC604 μPC24M05HF +5V REG
IC251 TDA2050 AUDIO OUT (L)
IC261 TDA2050 AUDIO OUT (R)
IC502 TDA8170 V OUT
IC001 SDA2083 TUNING CTL
Q005 DTC144EK Y/C SW
Q006 DTC144EK FRONT/REAR SW
Q002 DTA144EK REG SW
Q271 2SC2712G VOLTAGE DETECT
Q007 2SC2712G MODE 2 SWITCH
Q008 2SC2712G MODE 1 SWITCH
Q004 2SA1162G SYNC SEPARATOR
Q009 HZS5.6NB2TD CLIPPING SYNC LEVEL
Q003 2SA1162G SYNC SEPARATOR
Q251 2SC2712G AUDIO MUTE
Q261 2SC2712G AUDIO MUTE
Q598 2SA1162G VIDEO AMP
Q801 2SC2712G ABL AMP
Q805 2SC2688 H DRIVER
Q804 2SD1941 H OUT
D271 HZS13NB2TD VOLTAGE DETECT
D006 HZS33NB1TD VC VOLTAGE REGULATION
D009 HZS5.6NB2TD CLIPPING SYNC LEVEL
TUNING
CLIPPING SYNC LEVEL
SYNC SEPARATOR
VIDEO
R AUDIO
L AUDIO
H PHASE
CONNECTOR TABLES
D-18 2P BLK :MICRO
GND 7V
D-3 7P RED :S-MICRO
+14V +7V GND V BLK NR NR INIT 60/50
D-44 6P WHT :S-MICRO
F/R Y/C LED 1 LED 2 GND 12V
D-51 18P BLK :HINGE-P
GND P OUT 27V VANG V PAR V SAW V CENT V SIZE V SIZE GND GND H PLS ABL 1 ABL 2 12V H CENT GND GND
TO J1 BOARD J1-51
D-23 RIBON WIRE WITH 8IP PIN
TO H1 BOARD H1-23
L OUT GND GND R OUT
D-31 10P GRY :BTOB-P
V IN GND Y OUT GND V OUT YC-SWITCH C OUT GND SDA SCL
TO B BOARD B-31
D-21 10P GRY :BTOB-P
GND 14V GND GND 7V ST.BY GND VIDEO S-TV GND
TO V BOARD CNV-41
HUE ST.BY MUTE CHAR P/ON SHP INIT +12V SCP +BLK ABL
TO B BOARD B-32
D-22 10P GRY :BTOB-P
TO V BOARD CNV-42
PON TV GND TXD CLK GND R IN G IN B IN BLK
D-32 10P GRY :BTOB-P
BLK1 B OUT G OUT R OUT GND BLK TEXT B TEXT G TEXT R GND
TO B BOARD B-33
D-33 10P GRY :BTOB-P
D-83 2P WHT :MINI
GND GND
TO COATING EARTH ASSY
D-82 3P WHT :MINI
G2 200V GND
TO C BOARD C-82
D-84 6P WHT :MINI
H+ H+ H- H- V- V+

D (TUNING CONTROL / POWER CONTROL / AUDIO OUT H/V OUT)

TUNING

TO J1 BOARD J1-44

TO Y BOARD Y-3

TO H2 BOARD H2-2

CN-18 2P BLK :MICRO — GND, 7V

CN-3 7P RED :S-MICRO — +14V, +7V, GND, V BLK, NR, NR INIT, 60/50

CN-44 6P WHT :S-MICRO — F/R, Y/C, LED 1, LED 2, GND, 12V

CN-2 7P WHT :S-MICRO — LEDB, LEDA, NR, RES.LED, GND, +5V, SIRCS

IC001 SDA2083 TUNING CTL

IC002 CX81050A-09P ON SCREEN DISPLAY

IC003 BA4558 AFT CONPARATORE

IC005 SDA2546 MY MEMORY

Q001 DTC144EK 50/60Hz SW

Q002 DTA144EK REG SW

Q003 2SA1162G SYNC SEPARATOR

Q004 2SA1162G SYNC SEPARATOR

Q005 DTC144EK Y/C SW

Q006 DTC144EK FRONT/REAR SW

Q007 2SC2712G MODE 2 SWITCH

Q008 2SC2712G MODE 1 SWITCH

Q009 2SC2712G

D001 1SS133 50/60Hz SW

D002 HZS6.8NB3TD 50/60Hz SW

D003 1SS133 HUE CTL

D004 1SS133 DISPLAY

D005 HZS5.6NB2TD

D007 1SS133 PLOT RESET

D009 HZS5.6NB2TD CLIPPING SYNC LEVEL

D010 HZS6.2NB2TD

D011 HZS6.2NB2TD

CF001 12MHz

L001 27μH

CN-1 6P RED :S-MICRO — Y/C INIT, AV3 INIT, LC3, LC2, LC1, GND → TO H1 BOARD H1-1

CN-45 6P BLK :S-MICRO — GND, R OUT, L OUT, GND, R IN, L IN → TO J1 BOARD J1-44

CN-11 10P GRY :BTOB-P — C1MT, C2MT, C4, L IN, GND, R IN, 4-LEVEL, NC, GND, GND → TO A BOARD A-11

CN-12 10P GRY :BTOB-P — GND, VIDEO IN, GND, AFT, 33V, 5V, SCL, SDA, GND, 12V → TO A BOARD A-12

CN-41 18P BLK :HINGE-P — MODE 1, MODE 2, GND, SDA, SCL, 4 LEVEL, R, G, B, BLK, GND, C IN, GND, Y IN, GND, V IN, GND, V TV OUT → TO J1 BOARD J1-41

CN-31 10P GRY :BTOB-P — V IN, GND, Y OUT, GND, V OUT, YC-SWITCH, C OUT, GND, SDA, SCL → TO B BOARD B-31

CN-32 10P GRY :BTOB-P — HUE, ST.BY, MUTE, CHAR, P/ON, SHP INIT, +12V, SCP, +BLK, ABL → TO B BOARD B-32

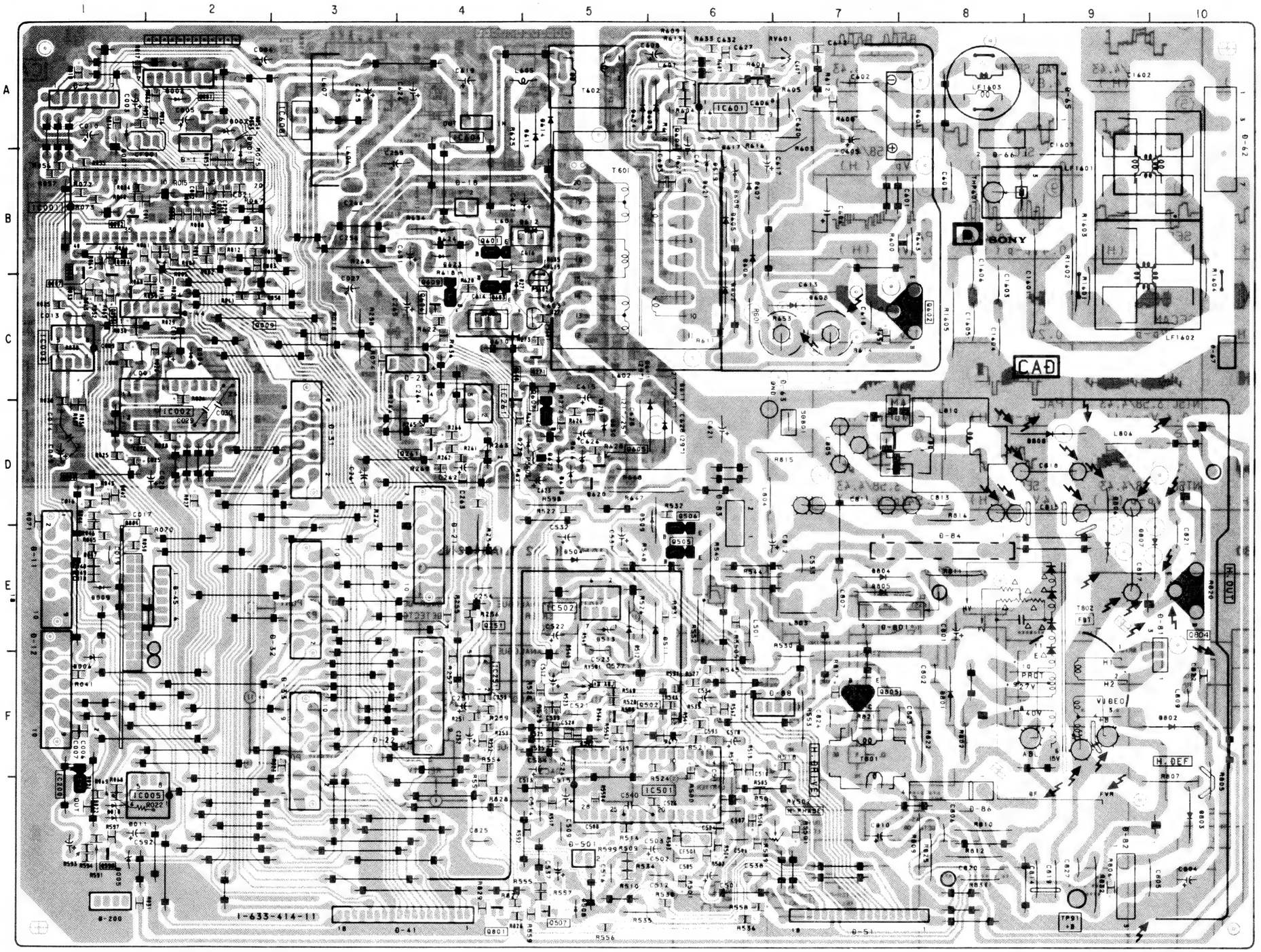
CN-21 10P GRY :BTOB-P — GND, 14V, GND, 7V, ST.BY, GND, VIDEO, S-TV, GND → TO V BOARD CNV-41

CN-22 10P GRY :BTOB-P — PON, TV, GND, TXD, CLK, GND, R IN, G IN, B IN, BLK → TO V BOARD CNV-42

CN-33 10P GRY :BTOB-P — BLK1, B OUT, G OUT, R OUT, GND, BLK, TEXT B, TEXT G, TEXT R, GND → TO B BOARD B-33

DY — H.SY, H.BY V.SY, V.SY

-D Board-

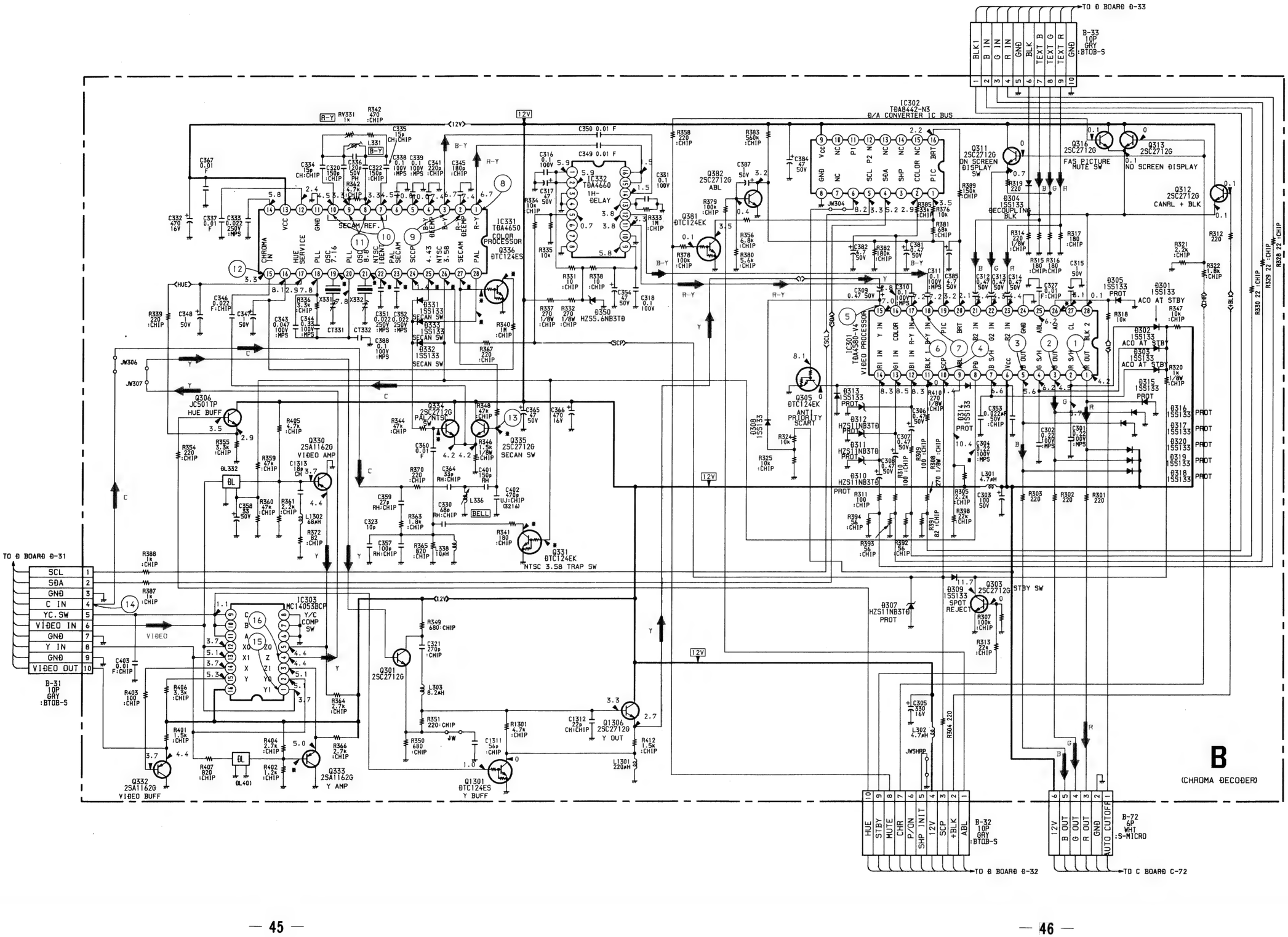


IC	
IC001	B-2
IC002	D-2
IC003	C-1
IC005	G-2
IC251	F-4
IC261	C-4
IC501	G-6
IC502	E-5
IC601	A-6
IC604	A-4
IC608	A-3

TRANSISTOR	
Q001	A-2
Q002	B-1
Q003	D-1
Q004	D-1
Q005	C-1
Q006	B-1
Q007	C-1
Q008	C-1
Q009	C-2
Q251	E-4
Q261	D-4
Q271	C-5
Q502	F-6
Q505	E-6
Q506	E-6
Q507	G-5
Q598	G-1
Q601	B-4
Q602	C-8
Q603	C-4
Q604	A-6
Q605	D-5
Q606	C-4
Q607	D-5
Q608	C-4
Q609	C-4
Q801	G-4
Q804	E-10
Q805	F-7

DIODE	
D001	B-2
D002	A-2
D003	A-2
D004	C-2
D005	G-1
D006	F-1
D007	A-1
D009	E-1
D010	G-1
D011	G-1
D271	C-4
D272	D-5
D501	G-6
D504	E-5
D506	F-5
D508	G-5
D509	D-6
D511	E-6
D512	E-5
D513	E-5
D601	A-8
D602	C-6
D603	A-6
D604	A-5
D605	B-6
D606	B-6
D607	B-6
D608	C-7
D609	B-6
D610	C-4
D611	D-6
D612	B-5
D613	A-5
D614	A-5
D616	D-5
D617	A-6
D618	D-5
D619	B-6
D620	D-5
D621	B-6
D622	D-5
D623	B-4
D624	B-4
D630	D-5
D801	F-8
D802	F-10
D803	G-10
D804	E-7
D805	E-7
D806	E-9
D807	E-10
D808	D-9

VARIABLE RESISTOR	
RV501	F-5
RV502	G-7
RV601	A-7



• WAVEFORMS B B

① PAL, SECAM 4.8Vp-p (H)

④ 1 Vp-p (H)

⑦ PAL, SECAM 1.1Vp-p (H)

⑨ SECAM 1.3Vp-p (H)

⑫ NTSC 3.58/4.43 0.05Vp-p (H)

⑭ NTSC 3.58/4.43 1.1Vp-p (H)

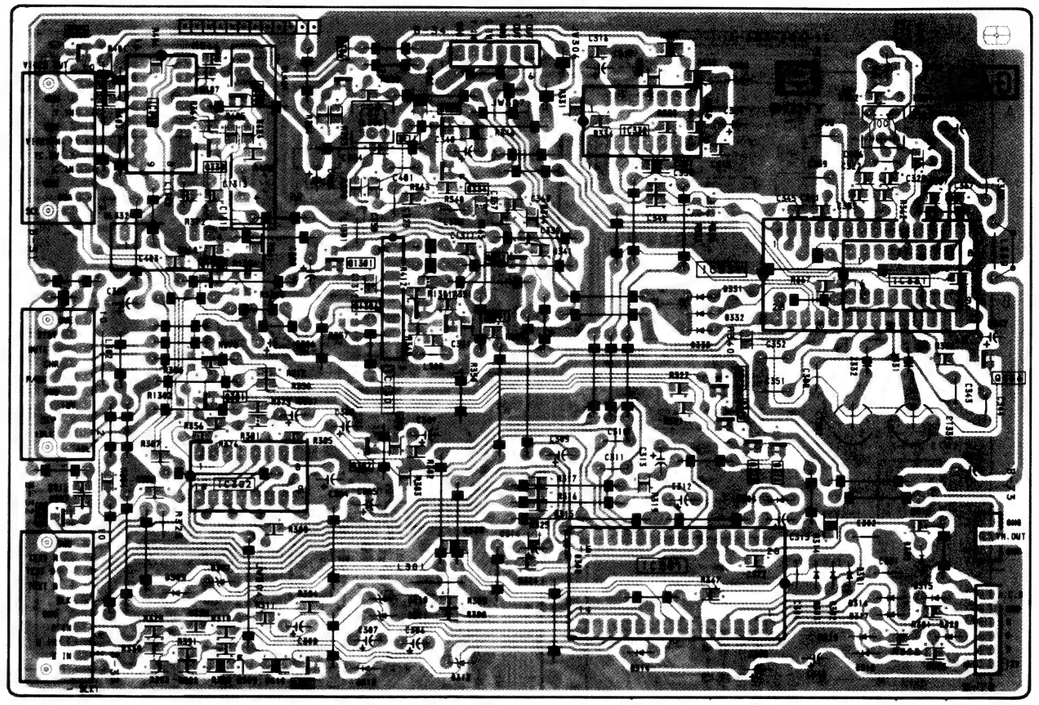
		PAL	SECAM	NTSC3.58	NTSC4.43
IC301	⑧	0.1	0.1	5.8	0.1
	㉖	6.7	6.8	5.1	5.1
IC331	⑲	3.1	3.6	3.1	2.8
	㉑	3.0	3.5	2.9	2.7
	㉒	5.6	5.6	7.1	7.2
	㉓	7.5	7.0	5.6	5.6
	㉕	0.1	0.1	0.1	5.8
	㉖	0.1	0.1	5.8	0.1
	㉗	0.1	5.8	0.1	0.1
	㉘	5.9	0.1	0.1	0.1
Q331 (B)		0.1	0.1	5.8	0.1
(C)		1.5	1.9	0	0.8
Q333 (B)		3.4	4.4	4.4	4.4
Q334 (B)		4.9	0.1	4.8	4.8
Q335 (B)		0.1	4.8	0.1	0.1
Q336 (B)		0.1	5.8	0.1	0.1
(C)		7.3	0	7.3	7.3

• WAVEFORMS B BOARD

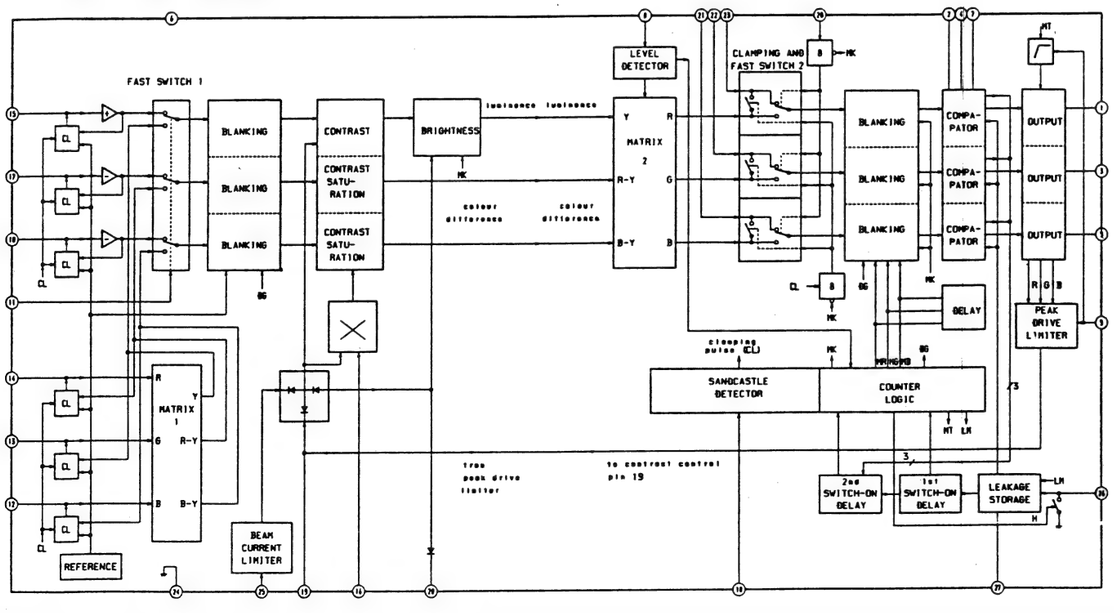
① PAL, SECAM 4.8Vp-p (H)	① NTSC 3.58/4.43 4.8 Vp-p (H)	② PAL, SECAM 4.8 Vp-p (H)	② NTSC 3.58/4.43 4.8Vp-p (H)	③ PAL, SECAM 4.8Vp-p (H)	③ NTSC 3.58/4.43 4.8Vp-p (H)
④ 1 Vp-p (H)	⑤ PAL 0.4Vp-p (H)	⑤ SECAM 0.36 Vp-p (H)	⑤ NTSC 3.58/4.43 0.46Vp-p (H)	⑥ PAL, SECAM 0.9Vp-p (H)	⑥ NTSC 3.58/4.43 0.7Vp-p (H)
⑦ PAL, SECAM 1.1Vp-p (H)	⑦ NTSC 3.58/4.43 1 Vp-p (H)	⑧ PAL 0.5Vp-p (H)	⑧ SECAM 1.1 Vp-p (H)	⑨ NTSC 3.58/4.43 0.4Vp-p (H)	⑨ PAL 0.6Vp-p (H)
⑨ SECAM 1.3Vp-p (H)	⑨ NTSC 3.58/4.43 0.6 Vp-p (H)	⑩ SECAM 1.4 Vp-p (H)	⑪ SECAM 0.2Vp-p (H)	⑫ PAL 0.2Vp-p (H)	⑫ SECAM 0.12Vp-p (H)
⑫ NTSC 3.58/4.43 0.05Vp-p (H)	⑬ PAL 0.4Vp-p (H)	⑬ SECAM 0.1 Vp-p (H)	⑬ NTSC 3.58/4.43 0.4 Vp-p (H)	⑭ PAL 1 Vp-p (H)	⑭ SECAM 1 Vp-p (H)
⑭ NTSC 3.58/4.43 1.1Vp-p (H)	⑮ PAL 1 Vp-p (H)	⑮ SECAM 0.9Vp-p (H)	⑮ NTSC 3.58/4.43 1 Vp-p (H)	⑯ PAL, SECAM 0.4Vp-p (H)	⑯ NTSC 3.58/4.43 0.54Vp-p (H)

		PAL	SECAM	NTSC3.58	NTSC4.43
01	⑧	0.1	0.1	5.8	0.1
	㉖	6.7	6.8	5.1	5.1
31	⑲	3.1	3.6	3.1	2.8
	㉑	3.0	3.5	2.9	2.7
	㉒	5.6	5.6	7.1	7.2
	㉓	7.5	7.0	5.6	5.6
	㉕	0.1	0.1	0.1	5.8
	㉖	0.1	0.1	5.8	0.1
	㉗	0.1	5.8	0.1	0.1
	㉘	5.9	0.1	0.1	0.1
31	(B)	0.1	0.1	5.8	0.1
	(C)	1.5	1.9	0	0.8
33	(B)	3.4	4.4	4.4	4.4
34	(B)	4.9	0.1	4.8	4.8
35	(B)	0.1	4.8	0.1	0.1
36	(B)	0.1	5.8	0.1	0.1
	(C)	7.3	0	7.3	7.3

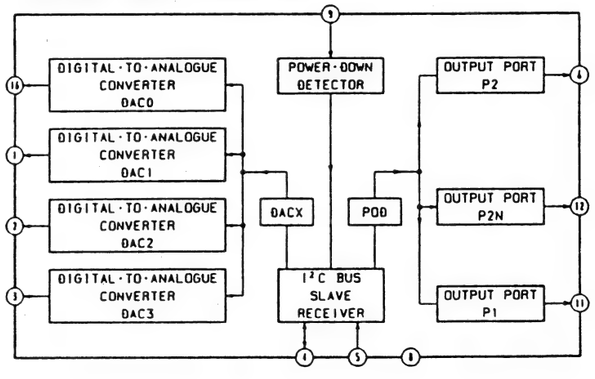
—B Board—

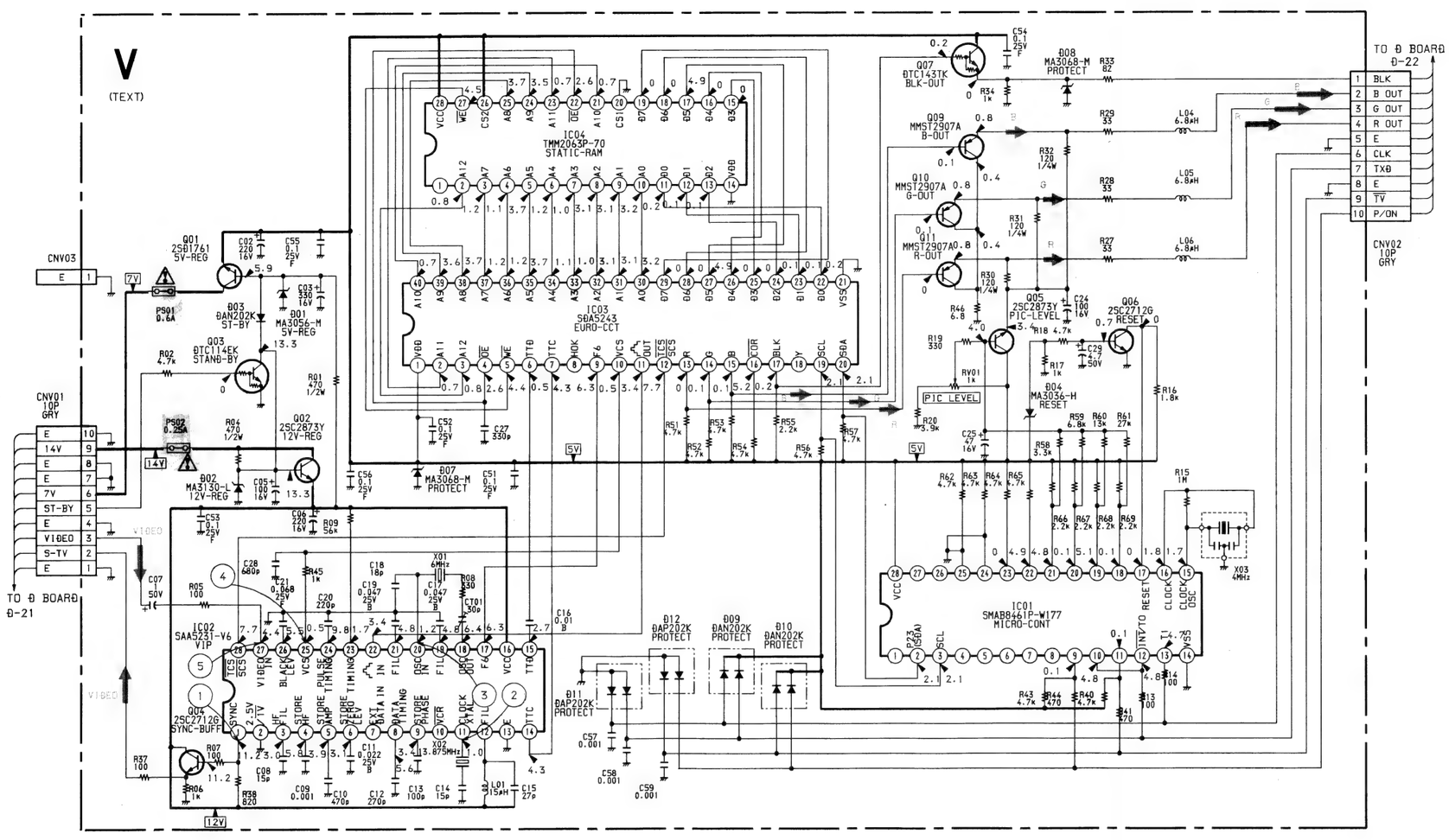


B BOARD IC301 TDA4580

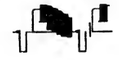
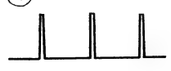


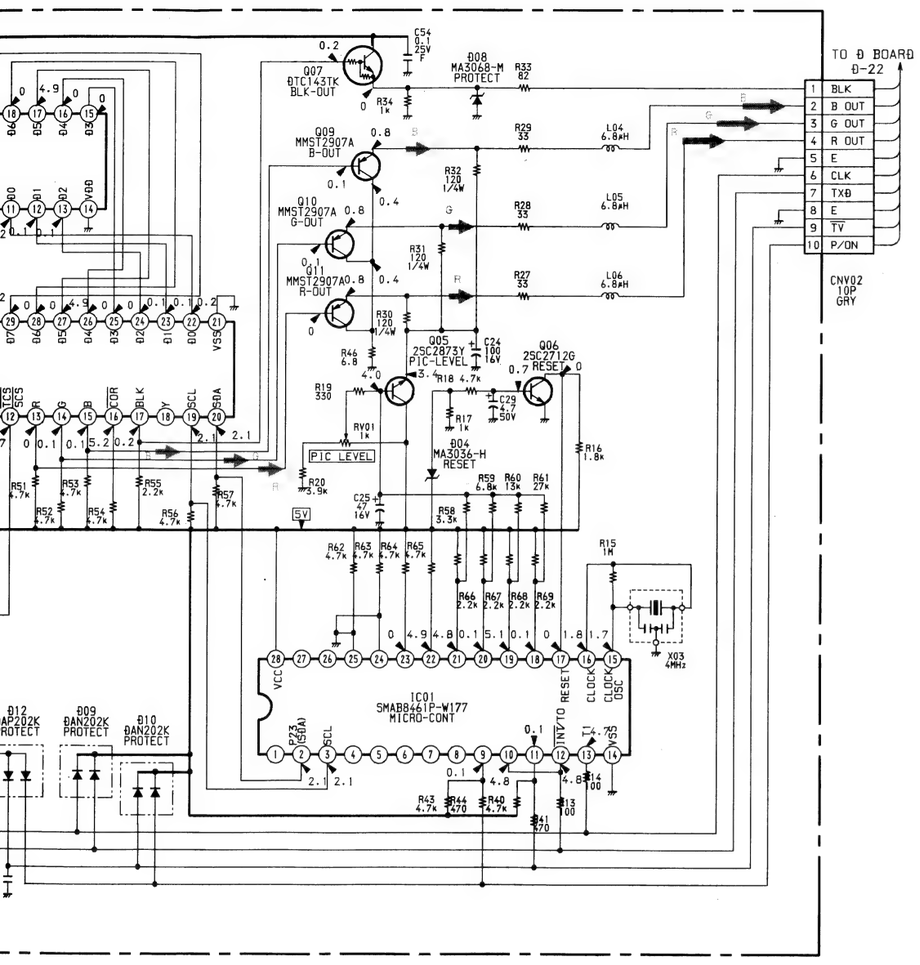
B BOARD IC302 TDA8442-N3

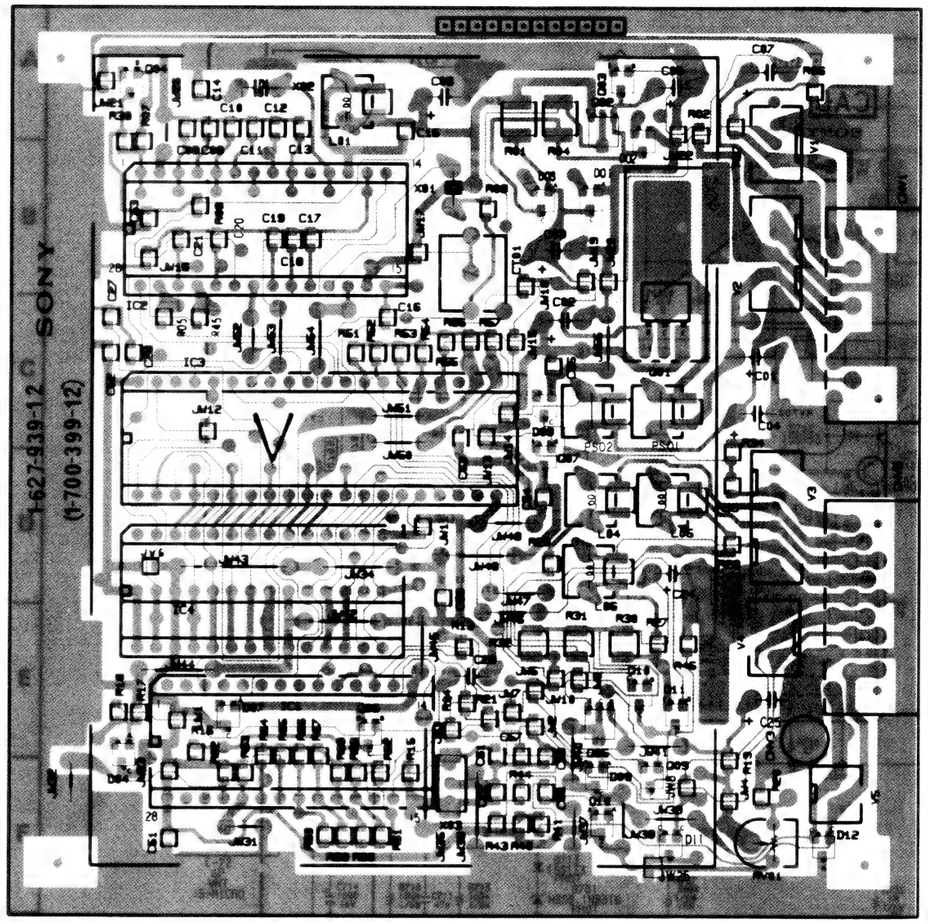




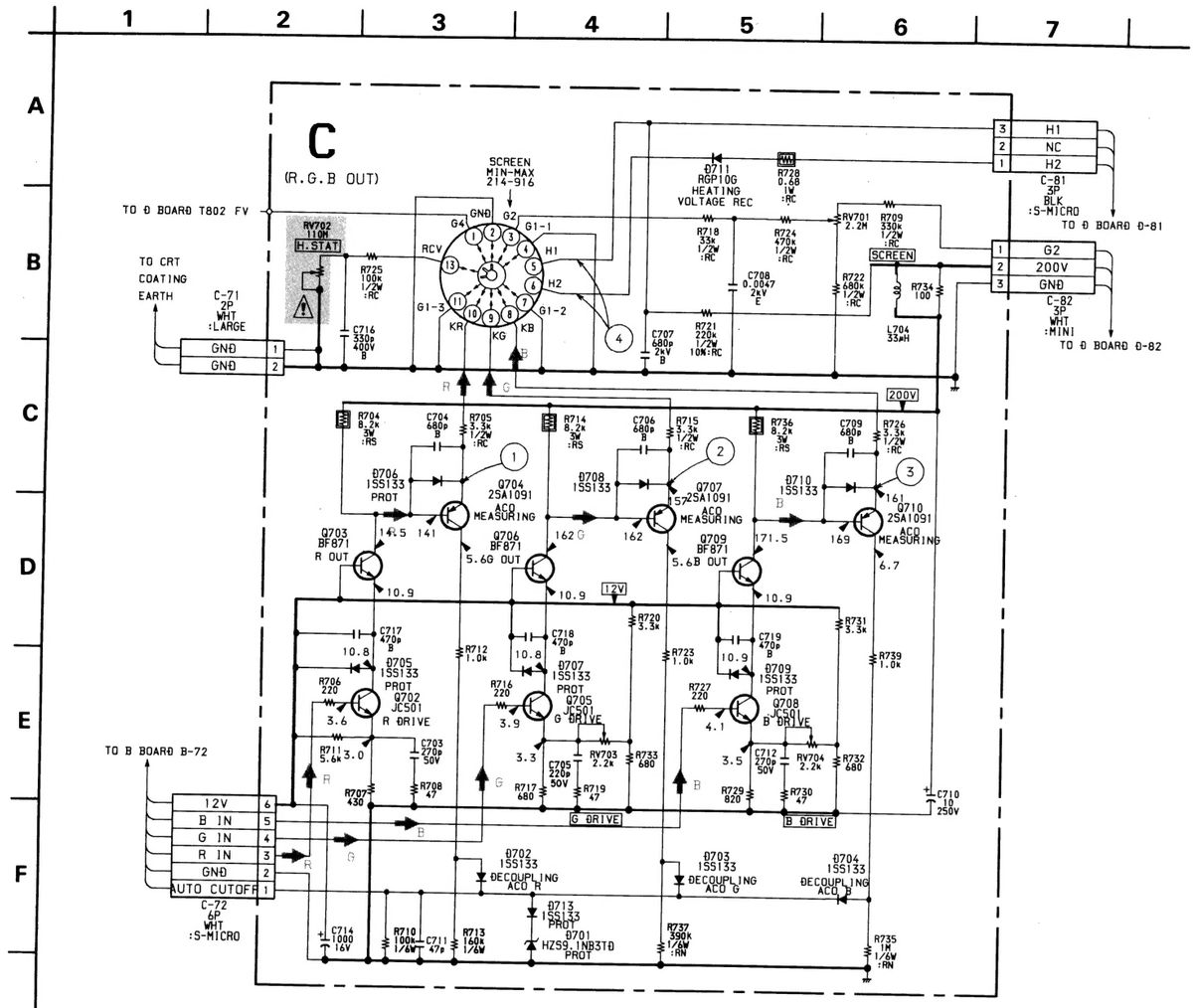
• **WAVEFORMS V BOARD**

①  0.9Vp-p (H)	②  0.9Vp-p(13.875MHz)	③  0.4 Vp-p (6MHz)
④  2.8Vp-p (H)	⑤  1 Vp-p (H)	


TO Ð BOARÐ
Ð-22
CNV02
10P
GRY
1 BLK
2 B OUT
3 G OUT
4 R OUT
5 E
6 CLK
7 TXÐ
8 E
9 TV
10 P/ON
Q07 ÐTC143TK BLK-OUT
Q08 MA3068-M PROTECT
Q09 MMST2907A B-OUT
Q10 MMST2907A G-OUT
Q11 MMST2907A R-OUT
Q05 2SC2873Y PIC-LEVEL
Q06 2SC2712G RESET
Ð04 MA3036-H RESET
PIC LEVEL
RV01 1k
IC01 SMAB8461P-W177 MICRO-CONT
X03 4MHz
Ð12 AP202K PROTECT
Ð09 ÐAN202K PROTECT
Ð10 ÐAN202K PROTECT


SONY
(1-700-399-12)
1-627-939-12 C

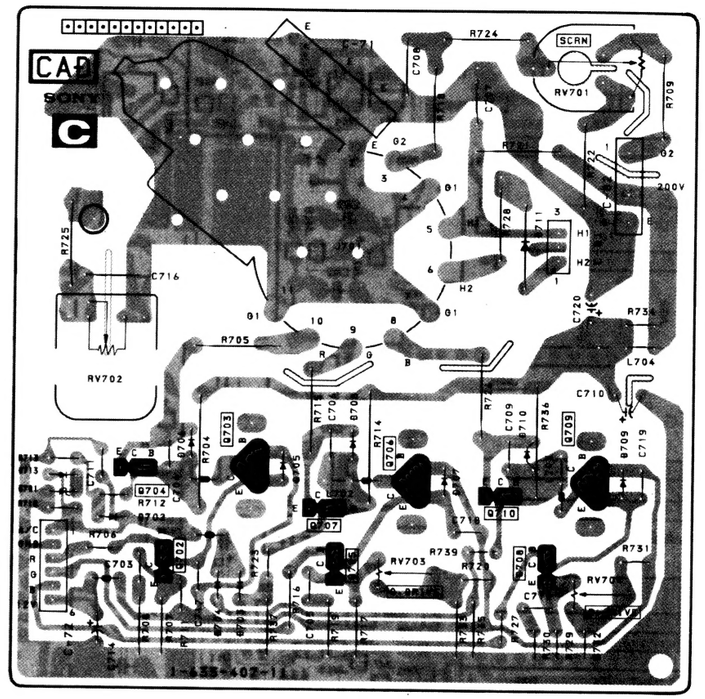
C [R・G・B OUT]



• **WAVEFORMS C BOARD**

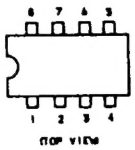
① 120Vp-p (H)	② 100Vp-p (H)
③ 80Vp-p (H)	④ 21 Vp-p (H)

—C Board—

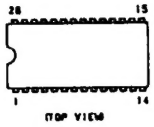


5-5. SEMICONDUCTORS

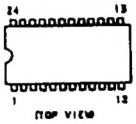
BA4558
SDA2546
TEA2014
TEA2031A
μPC4558C



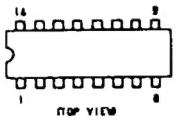
CXA1114P
CXK5864BSP-10L
MAB8461P-W177
SAA5231-V6
TDA4580-V4
TDA4650
TDA6200
TEA2028B



CXD1050A
TD6710AN



MC14053BCP
PCF8574
TC4049BP
TC4053BP
TDA4660
TDA8442-N3
TEA2260



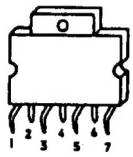
SDA2083
SDA5243

TA8662N

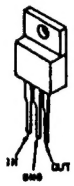
TC6011N

TDA2050

TDA8170



TYA7812CT
μPC24M05HF



BF871

DTA144EK
DTC114EK
DTC124EK
DTC143TK
DTC144EK
MMST29C7A
2SA1162G
2SC2712G

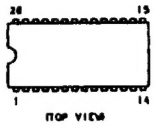
DTC124ES
DTC144ES

JA101
JC501
2SA1091-O
2SD789

2SB734
2SD773
2SD774

2SB1185-E
2SD1761-E

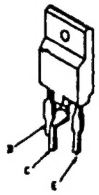
2SC2216



2SC2688

2SC2873Y

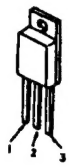
2SD1548-LB
2SD1941



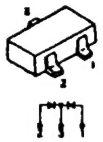
2SD1941-06

2SD2096

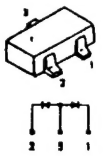
CTU-12S



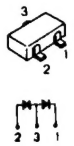
DAN202K



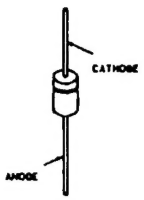
DAP202K



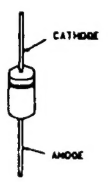
DA204K



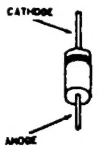
ERC06-15S
ERC25-06S



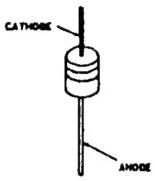
ES1F-V1
GP08DPKG23
RGP10G
RGP15J



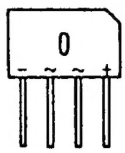
ERD29-08J



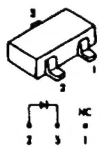
HZS10NB3TD
HZS11NB3TD
HZS13NB2TD
HZS15NB1TD
HZS33NB1TD
HZS36NB4TD
HZS4.7NB2TD
HZS5.6NB2TD
HZS5.6NB3TD
HZS6.2NB2TD
HZS6.8NB3TD
HZS7.5NB3TD
HZS9.1NB3TD
RD5.6ES-B2
1SS133



KBU4JL-6088



MA3036H
MA3056M
MA3068M
MA3130L

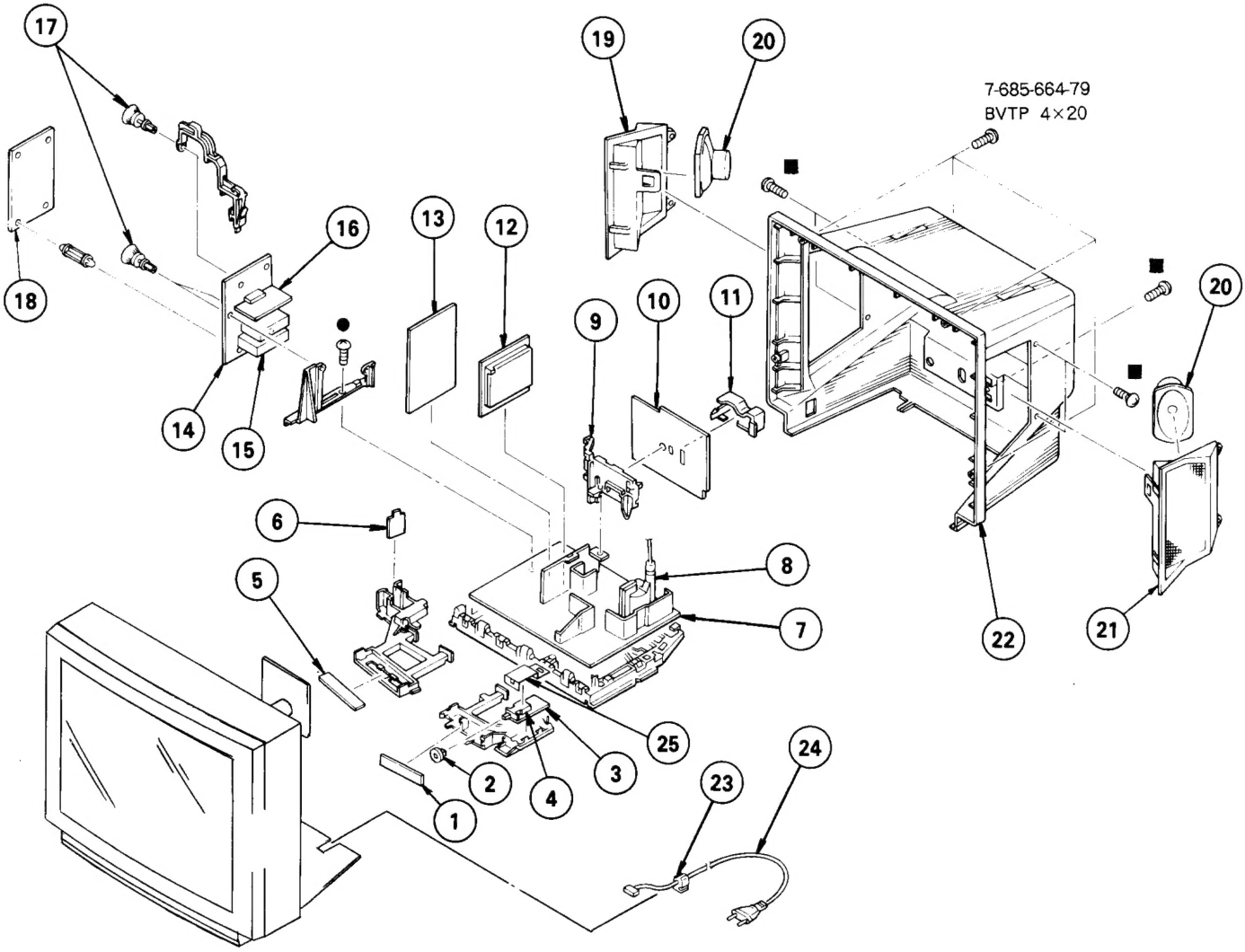


MC911

MC921

(1) CHASSIS

● : BVTP 3×12 7-685-648-79
■ : BVTP 4×16 7-685-663-79



(2) PICTURE TUBE